Professional Practice Portfolio

Keir Chaggar-Brown

May 10, 2024

Note: Hyperlinks that are for my work are notated by a *

Artist Statement:

Exploring the void of digital representations of memories collaged together into a dream. Contemplation while exploring, the nature of Travel. Innately familiar places visited in beautiful ways, collided into other memories and dreams. My work aims to make the viewer question the reality / physicality of the work in front of them, drifting from abstraction to the glimpses of reality. I share and build in a thriving community of free art and tools. I am self-taught digital impressionist video artist specialising in Blender and photogrammetry focusing on mindfulness in immersive dream scapes and showcasing work through YouTube and exhibitions. Point clouds themselves have an innate impressionistic aesthetic. I use point clouds to create environments designed for exploration; a topic integral to my work. Exploration as a form of narrative. Allowing audiences to see things from a new perspective or showing them something novel is a key part of my practice. Having a plastic perspective is healthy, seeing things differently can be enlightening as well as feeding back into a mindful practice. Video games influence my work as they are a deep exploration of environmental storytelling, using the environment itself to tell the story rather than any character. Also the culture and experience of video games has coloured my experience of the world. It is another language that I use. My art is made for people who play video games. The Void is the environment for my work, the empty, colourless, expanse of nothingness. This comes from video game out of bounds (Glitching or hacking your way outside of the intended play area), the mind and imagination, death, existentialism, the space between stars. The void is a innately human place, one where we are often confronted with our minds. A place for meditation. Another space that my work often confronts is that of liminal spaces. Open-source software and mentality effects how I operate as an artist as I restrict myself from using paid software, inaccessible for the masses. I believe in the democratization of art as something we can share. Additionally, memories, are core to my work and the new direction my work has taken, I can only show my memories and try explore these themes through my own existence.

Contents

1 Introduction 2

2 Jack Wolf 3

3 Gallery Visits 4
- 3.1 Tony Swain - Celiene Gallery Exhibition 4
- 3.2 Nadezdas Exhibition 5
  - 3.2.1 Dream Machine Exhibition 6

4 Free and Open Source Software 7

5 Inital Plans 9

6 Degree Show Environment Plans 12
- 6.1 Elevator Plans 15
- 6.2 Work Towards Elevator 17
- 6.3 Elevator Doesn't Work & Technical Projection Experiments 20

7 Proposals and Sponsorships 23

8 DIWO 25

9 Point Cloud Capture 27

10 Getting Started 31
- 10.1 Story Boards 32

11 McNeil's Exhibition 36

12 Monolith 37
- 12.1 Soundscapes - Ben Crick & Michaela French Exhibition 37
- 12.2 How to Display Digital Art 38
- 12.3 Mirror 40

13 Bedroom Exhibition 42

14 Thesis 44

15 RSA 49

16 Capture Simulation Point Cloud 52

17 Monolith Construction 53

18 Simulations 55

19 Performance, Rendering and Planning 58

20 Video Development 61

21 Inspiration / Research 70
- 21.1 Films 70
- 21.2 Music 71
- 21.3 'Art' 71
  - 21.3.1 Point Cloud Artists 71
  - 21.3.2 Other Artists 72
- 21.4 Games 73
- 21.5 Technology 75

21.5.1 'Holographic' Displays . . . 75
21.5.2 Blender . . . 75

22 Installation & Thoughts 76

23 Keir Chaggar-Brown - Curriculum Vitae 79
23.1 Profile . . . 79
23.2 Education & Qualifications . . . 79
23.3 Emplyment & Work Experience . . . 79
23.4 Exhibitions . . . 79
23.5 Skills . . . 80
23.6 Portfolio . . . 80

1 Introduction

Photogrammetry (interchangeable with photoscan) is a process in which you can capture an object or environment. These construed environments are explorable in all 3 dimensions. This allows me to construct new digital places with these captured objects and environments. This is the fundamental starting point of my current practice. You can obtain a mesh, a point cloud or recently, a Neural Radiance Fields (NeRFs) from the photogrammetry process. Mesh's are in ways more physically based than the point cloud, however, it loses a level of visual realism and detail compared to the point cloud. This is why I use the point cloud, because of its impressionistic effect. It simplifies the world down to a list of positions and colours, the instructions to digitise and manipulate the real world. The advantages of using point clouds over traditional modelling seen in Pixar films, is that there is nothing more realistic and immersive than real life. Arts often use reference images to simulate real phenomena, but in this case, we can extract every detail from the reference image automatically. This can be seen in Quixel, a company photoscanning assets for films and games. They capture every tree, rock, and bench they can find, in a high-resolution model to collage realistic environments with ease, allowing rapid development of environments. I was first inspired to create point clouds 4 years ago when I found Benjamin Bardou's point cloud work.Shared Memories - Benjamin Bardou

This was my introduction to the 3D digital realm. Since then, I have been practising my general digital artistic practice as well as exploring point clouds as a medium. With the 3D digital realm impressiveness is important. My art has to be a magic trick. Not knowing how it works or seeing behind the curtain is essential to keep it different, to keep it a place that blurs reality. If the viewer knew, the illusion would be shattered, and we would understand the construction of the space. This would give the viewer an understanding of its fabricated nature, but if we keep the illusion up, the viewer can exist in an innate place. Open-source software refers to software that is available to the public for free use, modification, and distribution. By using open-source software like Blender, artists can take advantage of the work done by the wider community of developers, who constantly improve the software and add new features. This helps artists to stay up to date with the latest technology and techniques in the industry, without having to pay for expensive updates or licenses. Moreover, open-source software encourages collaboration, allowing artists to work together on projects and share their knowledge and expertise with one another. This can be particularly beneficial for artists who are just starting out and looking to build their skills and network. In summary, open-source software like Blender is a valuable tool for artists as it provides accessibility, versatility, and community support. It allows artists to create stunning visuals and stay up to date with the latest techniques in the industry, while also fostering collaboration and knowledge-sharing among artists. This is the basis in which I am exploring my practice, through the dissemination of artistic knowledge I am hoping to foster a community of line minded individuals. This can be seen in how I use YouTube to share my work and produce tutorials on the exact methodology and skills required to recreate my work. Please note, there is a glossary included in this document to enable accessibility.

To distil down my work and define what the foundations of my environmental design we must look at surrealism, liminal spaces, the void. Here we find the greatest influences and where my work exists within the art world. Surrealism, liminal spaces and the void all deal with subtraction. The removal of an element that should be there. A change to the rules of reality that allow us to still understand somewhat, what we are looking at, this is important to not drift into the world of pure abstraction. Abstraction is often more raw expression but lacks the foundation to twist our perception. It is the twisting of perception that I am interested in as seeing things in a new way is a fulfilling way to observe life.

We start with surrealism as it is the foundational artistic movement that the work exists within. Looking at the greats like Salvador Dali and René Magritte we can see how massive an influence they have on contemporary art. They have a fundamental emotional value that I am looking to replicate. It sometimes can be unsettling, but that's not quite correct. For me they represent a more technical understanding of perspective and human perception. By leaving 90% of the work traditional and normal and changing the 10% to not follow logical or physical rules the viewer is grounded and an accessible path into metaphor. The psychological effect of that 10% leads initially to confusion, as our brains don't quite recognise the pattern it is looking at, is has deviated from reality in a way that is new and intriguing. Left in a state where there is no logical answer forces us to feel and approach the work emotionally. We can find that these works often wear the metaphor on their sleeves. Maybe my work is more like the photography of Gregory Crewdson and that of Jeff Wall, who's work may be more cinematic and realistic than Dali, but share the surrealism of narrative. Intense and mundane storytelling is used throughout his work, but in this cinematic light that has a sterility and artificial appearance, even though it looks real. Jeff Wall is also interested in the narrative behind the mundane and every day. It is the staging of these photographs that seem surreal.

One of my favourite installations is Brian Eno's '77 million Paintings' is a generative art installation that creates an ever-evolving visual landscape using a set of computer algorithms. Eno discusses in an interview that one of the most inspiring things for him reflecting on his piece was a doctor who wanted to install the work in a hospital. Both nurses and patients began to use it once it was installed, it aided their healing, as many believe that you heal faster with a healthier mind. This made me look at mindfulness and how you could design an environment to facilitate that experience. In the works of Hito Steyerl's 'Factory of the Sun' or Olafur Eliasson's 'The Weather Project' they controlled the atmosphere with an 'artificial mist' that helped tell his story and create a beautiful simulacrum of a sunset, the atmosphere adding depth and a warm glow to the light.

2 Jack Wolf

*Unedited no audio - just my renders of each shot

This year I completed my work for Jack Wolf an artist I have been collaborating with for about 4 years. We have been working on finishing a project he started in 2017. I have finally had enough time to complete each shot that we have meticulously planned and rendered and re-rendered, iteration after iteration, slowly narrowing down on Jacks goal. Jack is now working on the final edit and hopefully later this year the video should be finished with matched audio and subtitles. We decided to go for a more simple 'interview' style camera shot. Shoulder height, steady, in a wide and then pull in for a quick close. I also made a intro and ending that where in point clouds that we had to add movement to, to mimic the movement of the kinect footage. This was quite complex due to the processing power needed to move a point cloud that large, and I had to develop a LOD (level of detail) system, that loads in different complexity of objects at different distances from the camera, allowing me to drastically improve the performance while only mildly degrading the image. The point clouds where generated by me with Jacks footage of the locations he visited in Beirut and other nearby locations. The process was really interesting to learn mostly about the relationships between a college and how to work together to make the best piece. Jack initially contacted me to get technical help with his project after finding my YouTube channel and since then I have dramatically developed my practice. Jack was quite particular when It came to the correct shot. I learnt from this process that iteration speed is more important that quality at the start. There isn't much point investing too much into visuals of the shot when the camera angle is wrong. The biggest change we made this year was in the final round of iterations I went away to make them by myself. This was due to the need for more artistic flow as we where limited by communication. With Jack by biggest accomplishment is how I learnt to work on many shots simultaneously and balanced the technical requirements of having around 20 different scenes.

3 Gallery Visits

3.1 Tony Swain - Celiene Gallery Exhibition

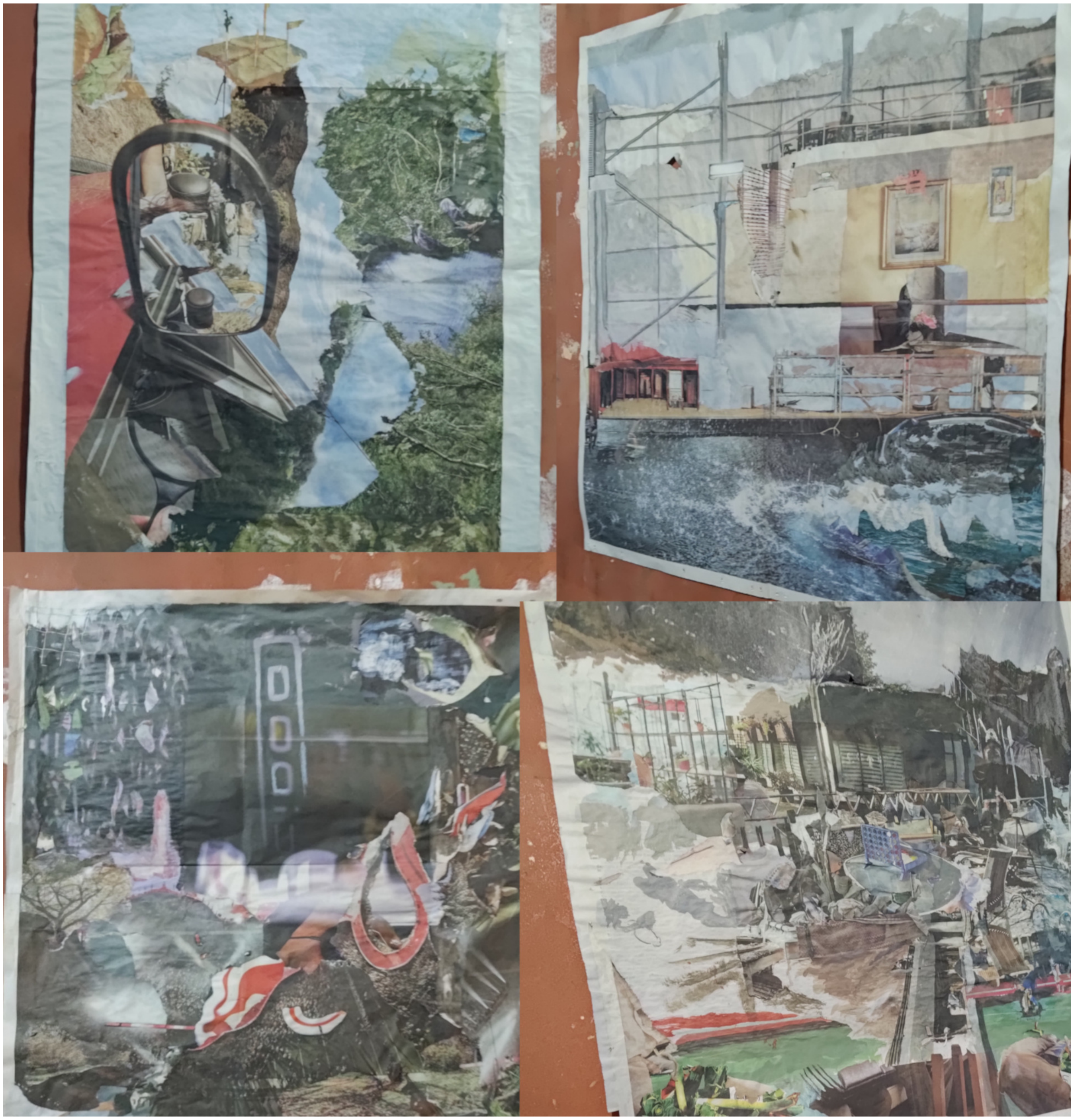
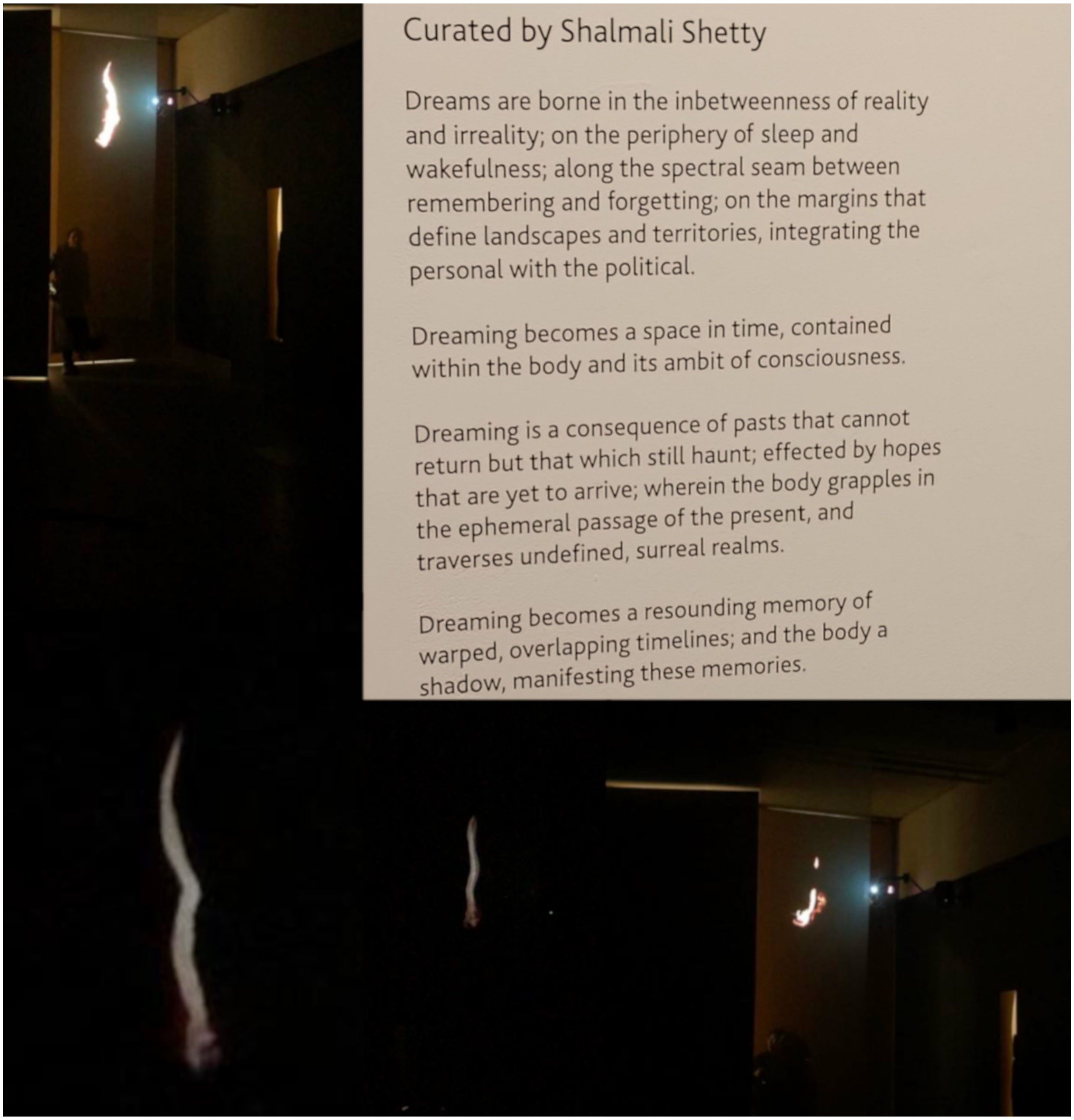


Figure 1: Tony Swain displayed a number of is works on the walls of the Celiene Gallery, they are hallucinogenic dreamscapes collaged seamlessly together, I am really intrigued by how he achieves this blend of space and objects in a way that doesn't pay attention to the original form of the newspaper is it made upon. Another aspect of Swains work which I studied was the objects and locations that felt so familiar, it was not a place of fantasy.

3.2 Nadezdas Exhibition



Curated by Shalmali Shetty

Dreams are borne in the inbetweenness of reality and irreality; on the periphery of sleep and wakefulness; along the spectral seam between remembering and forgetting; on the margins that define landscapes and territories, integrating the personal with the political.

Dreaming becomes a space in time, contained within the body and its ambit of consciousness.

Dreaming is a consequence of pasts that cannot return but that which still haunt; effected by hopes that are yet to arrive; wherein the body grapples in the ephemeral passage of the present, and traverses undefined, surreal realms.

Dreaming becomes a resounding memory of warped, overlapping timelines; and the body a shadow, manifesting these memories.

Figure 2: My friend Nadezda was part of a exhibition in the GSA Reid building, her work consisted of a projection onto a sheet of acetate hanging from the ceiling, the projection was of a fire. The stationary but consistently shifting spiral of flames gives a perfect aid for thoughts and reflections. The text with the work also very much resonated with the work that I wish to create, the haunting and surreal nature of the mind and dreams. The large dark room was another element of the work that I loved, when the large heavy door closed you felt blind in the darkness, to slowly stumble your way around the space discovering little mirrors that where placed so that you could see a reflection of the flame in the center. This use of mirrors is something I'd like to explore in my work, as it gives a different vantage point for the work, where you can be alone from the other people in the space and see it literally and metaphorically from a different angle. This work reminded me of a song by Jon Hopkins where he samples a talk by Ram Dass a spiritual leader, who's closing line in the song is "At some point you will find out that all that we are going to do for eternity, is sit around the fire." The music that accompanied this experience was lovely as it was a ever changing string like sound, however, it was not quite as religious as I had hoped, the raw power and magnitude of Nadezdas work should have had something as strong to accompany it.

3.2.1 Dream Machine Exhibition

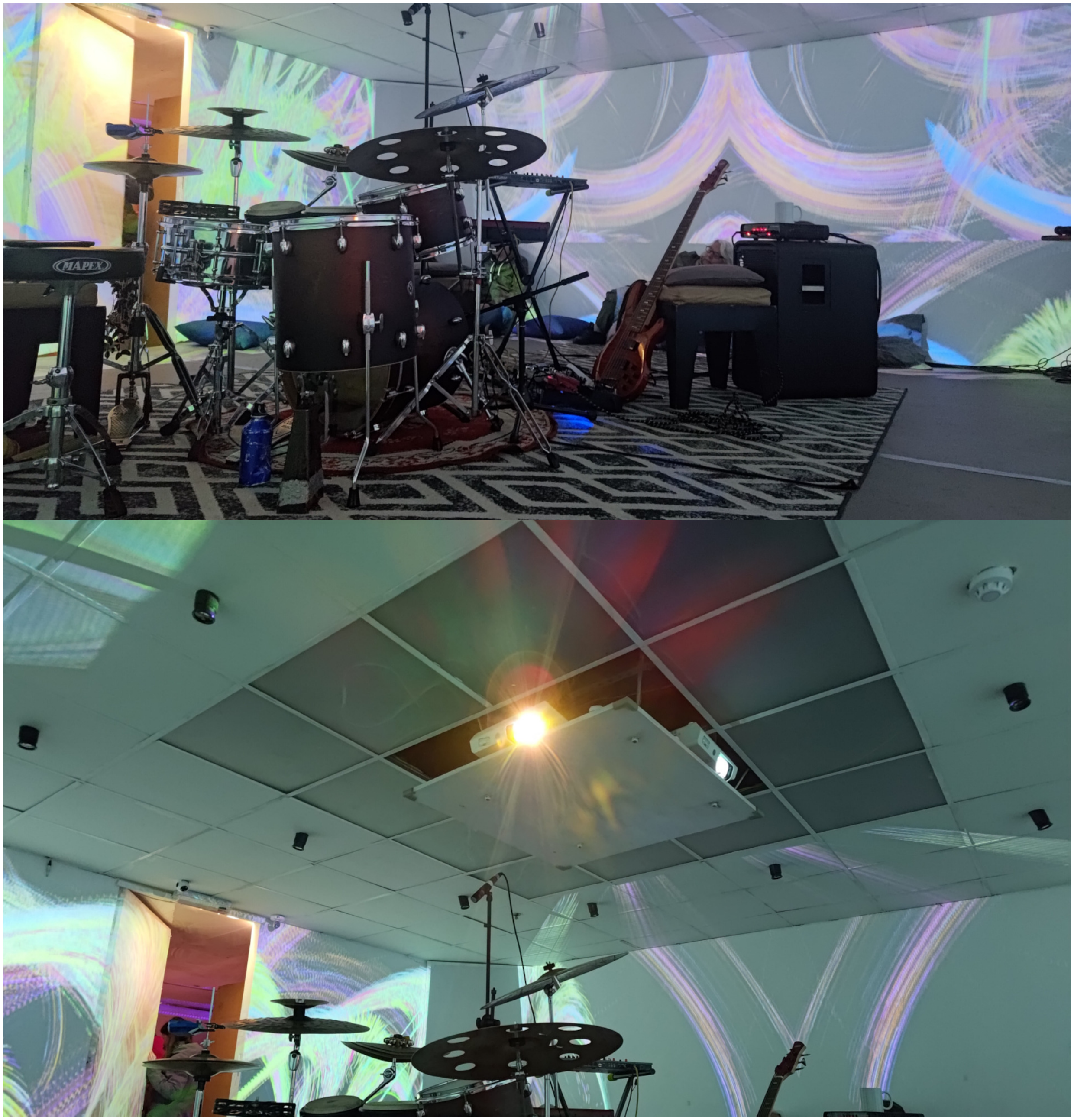


Figure 3: This was a live music performance in a 4x4 meter room, with the audience around the side and the band in the middle of the room. The door was integrated into the wall so the projection was almost a 360 degree experience. At the start the graphics where constantly falling/moving down, which gave the feeling of being in a elevator and rising. Having to look around the room at different bits was interesting. The way they projected was really interesting having all four projectors in a drop down ceiling, this is a good way of having the viewer not block all of the projection. The projectors didn't reach the corners very well, so the image would make large jumps. There where people sat around the edge of the room so where ever you looked there was another person looking back at you. There where times when the image would only be behind you, which was frustrating as we where sat on the floor, you would have twist you neck around to see the image, only to turn around again as it moves off quickly. The band distracted from the visuals and the visuals distracted from the band, it was nice when they reacted in time, but there was no way to see what was going on, too messy of an idea. The white walls meant that there was so much glow in the room when it was bright, ruining the contrast of the other projections. A video of the gig

4 Free and Open Source Software

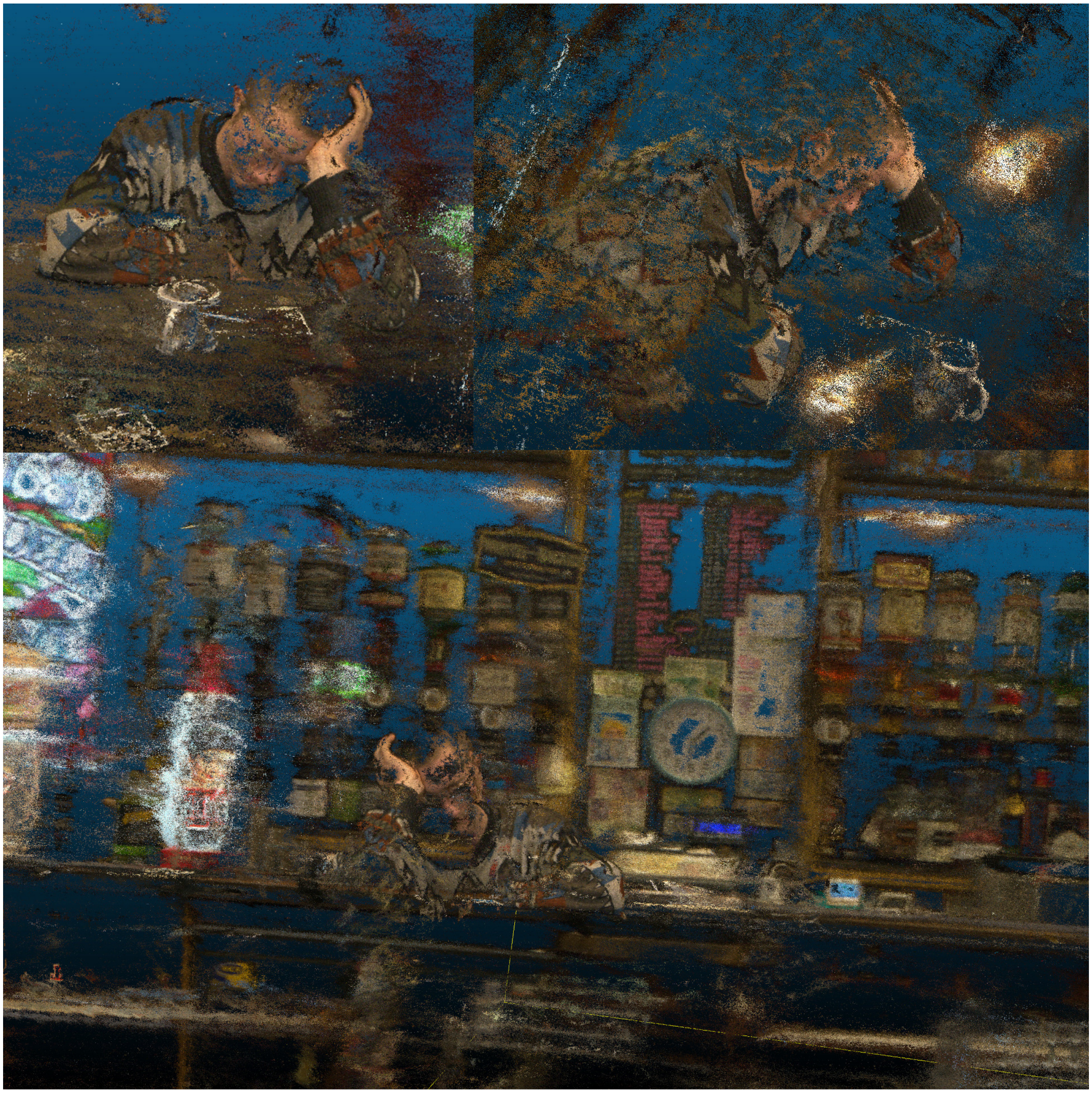
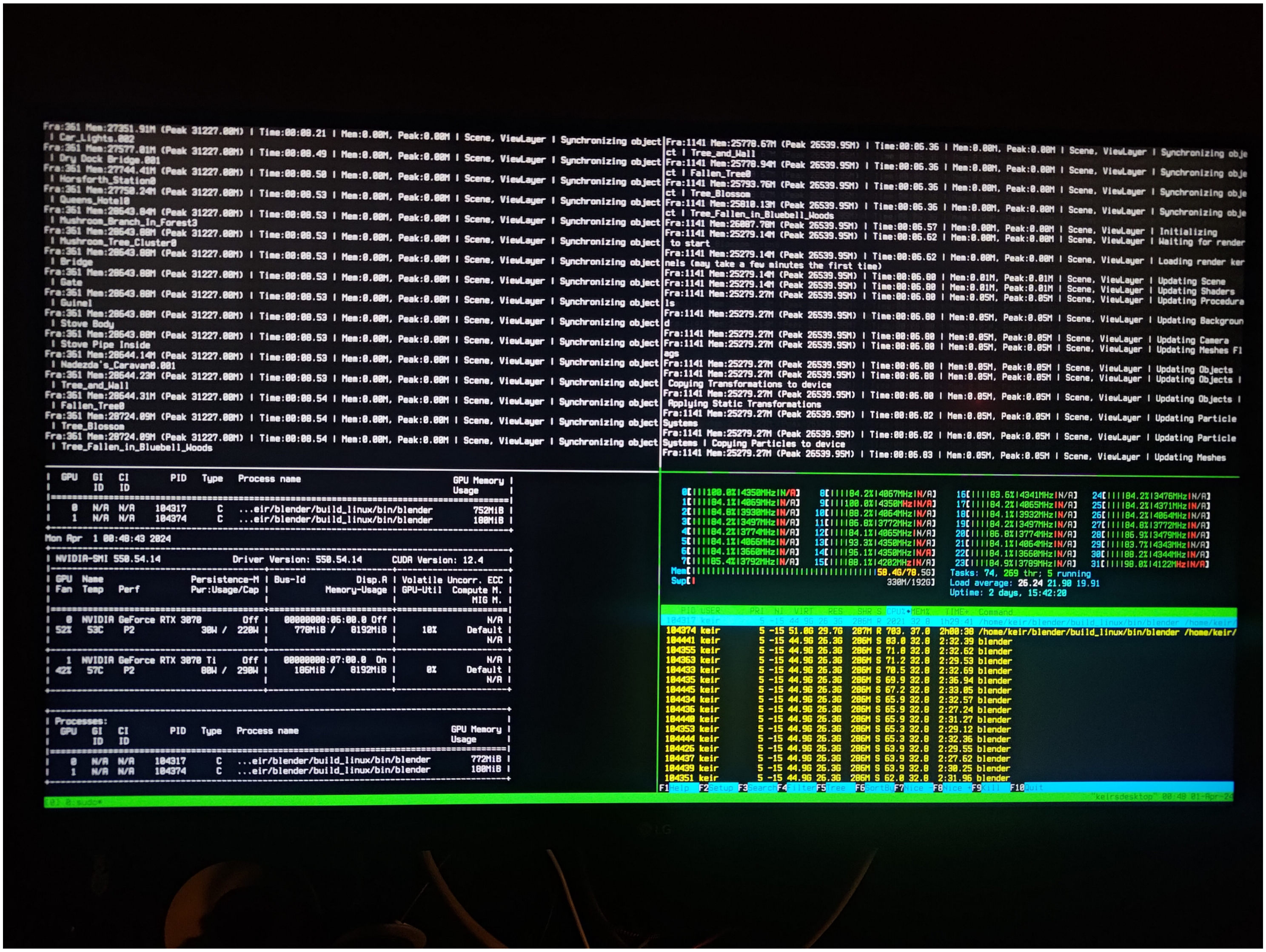


Figure 4: New test of colmap parameters with Colmap 3.7 which drastically changed the parameters I was using. I had to perform lots of tests to find parameters that produced a dense image with lots of detail and a interesting amount of noise but not enough that it hides the true image, as point cloud noise is nice to look at, it looses the reason that I captured the location in the first place, the feel of the visually familiar elements. This point cloud is of the pub McNeil's my local, and where a few of my friends work. I captured this point cloud on a quiet day and got my friend who is a regular there to sit at the bar. I asked him to rest his hand on his head so that he would remain relatively still throughout the shoot, otherwise he wouldn't as be clear and defined in the point cloud, I had the idea afterwords of using makeup foundation to remove any shine from peoples skin to capture that without reflections that cause the forehead in this point cloud to not appear.

As part of this year I have changed the operating system of my computer where I make all of my work. This computer is my pallet and it has to be right for me and my philosophy. Free and Open Source Software (FOSS) is a philosophy and practice of creating and sharing software in a way that all people will be able to access and share for in perpetuity. It is the belief of sharing information to better ourselves that drives this force. And due to its free nature it is proof that others can make in this space without having to be wealthy. I moved first to popos. I then started using DWM as a windows manger. I used Latex and texmaker to write my dissertation. I then moved to Arch Linux for its simplicity. I started to learn vim for writing documents.

I have added lots of other software written by the masses and the community of FOSS. Not by a greed multinational trillion dollar company. I can somewhat confidently say that the entirety of my computer excluding the hardware is open source and is free for anyone, and can be fixed and improved by anyone, so although my art appears advanced it is achievable. This gives me more opportunity for possible performance gains and better tools for automating processes that may take a lot of manual labour.



```
Fra:361 Mem:27351.91M (Peak 31227.00M) | Time:00:08.21 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Car_Lights.002
Fra:361 Mem:27577.01M (Peak 31227.00M) | Time:00:08.49 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Dry Dock Bridge.001
Fra:361 Mem:27744.41M (Peak 31227.00M) | Time:00:08.50 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Horsforth_Station0
Fra:361 Mem:27750.24M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Queens_Hotel0
Fra:361 Mem:28643.04M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Mushroom_Branch_In_Forest3
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Mushroom_Tree_Cluster0
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Bridge
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Gate
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Guinel
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Stove Body
Fra:361 Mem:28643.08M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Stove Pipe Inside
Fra:361 Mem:28644.14M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Nadezda's_Caravan0.001
Fra:361 Mem:28644.23M (Peak 31227.00M) | Time:00:08.53 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Tree_and_Wall
Fra:361 Mem:28644.31M (Peak 31227.00M) | Time:00:08.54 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Fallen_Tree0
Fra:361 Mem:28724.09M (Peak 31227.00M) | Time:00:08.54 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Tree_Blossom
Fra:361 Mem:28724.09M (Peak 31227.00M) | Time:00:08.54 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing object
 | Tree_Fallen_in_Bluebell_Woods
```

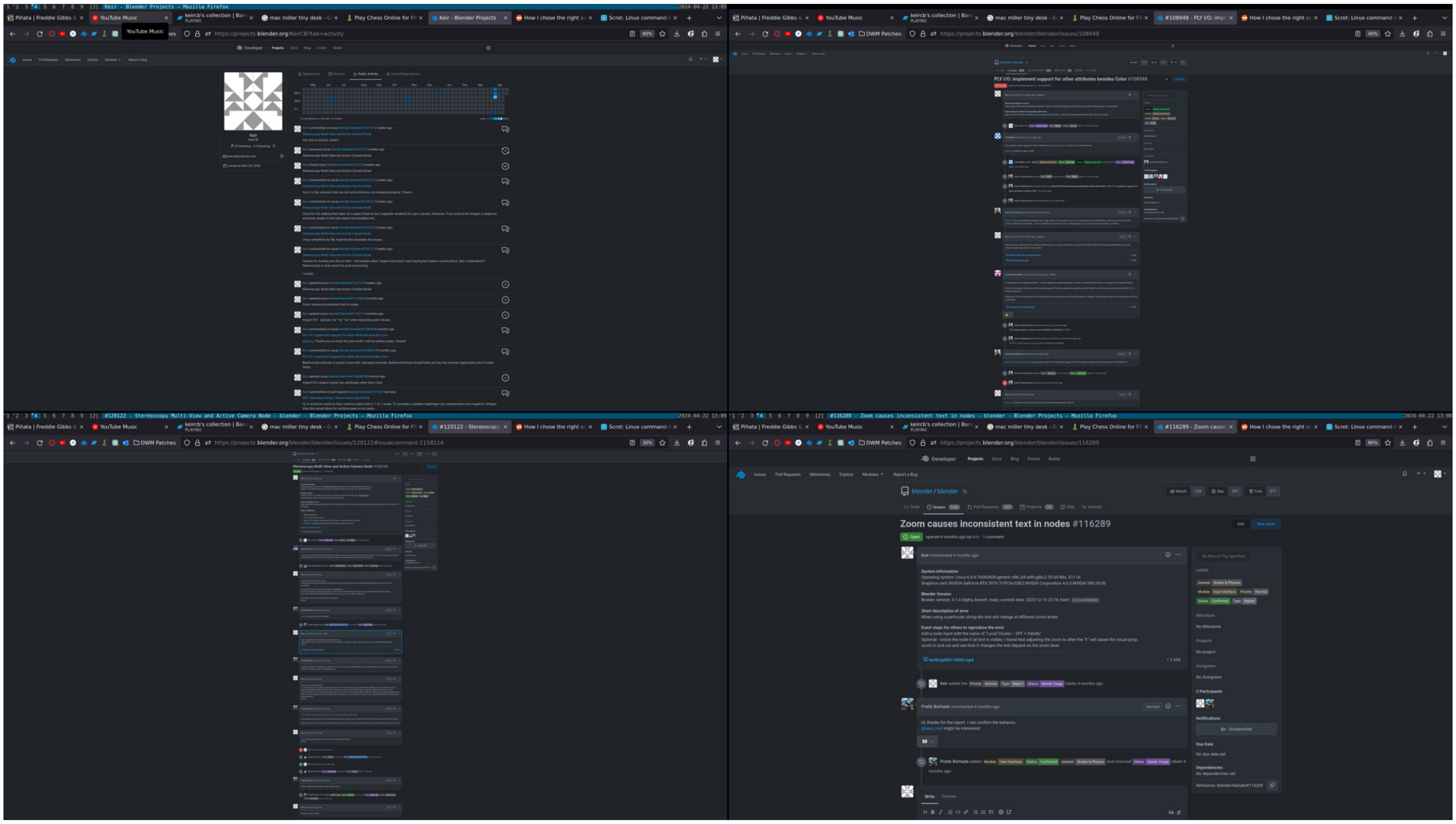
```
Fra:1141 Mem:25778.67M (Peak 26539.95M) | Time:00:06.36 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing obje
ct | Tree_and_Wall
Fra:1141 Mem:25778.94M (Peak 26539.95M) | Time:00:06.36 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing obje
ct | Fallen_Tree0
Fra:1141 Mem:25793.76M (Peak 26539.95M) | Time:00:06.36 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing obje
ct | Tree_Blossom
Fra:1141 Mem:25810.13M (Peak 26539.95M) | Time:00:06.36 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Synchronizing obje
ct | Tree_Fallen_in_Bluebell_Woods
Fra:1141 Mem:26087.78M (Peak 26539.95M) | Time:00:06.57 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Initializing
Fra:1141 Mem:25279.14M (Peak 26539.95M) | Time:00:06.62 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Waiting for render
 to start
Fra:1141 Mem:25279.14M (Peak 26539.95M) | Time:00:06.62 | Mem:0.00M, Peak:0.00M | Scene, ViewLayer | Loading render ker
nels (may take a few minutes the first time)
Fra:1141 Mem:25279.14M (Peak 26539.95M) | Time:00:06.80 | Mem:0.01M, Peak:0.01M | Scene, ViewLayer | Updating Scene
Fra:1141 Mem:25279.14M (Peak 26539.95M) | Time:00:06.80 | Mem:0.01M, Peak:0.01M | Scene, ViewLayer | Updating Shaders
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Procedura
ls
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Backgroun
d
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Camera
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Meshes Fl
ags
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Objects
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Objects |
 Copying Transformations to device
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.80 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Objects |
 Applying Static Transformations
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.82 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Particle
Systems
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.82 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Particle
Systems | Copying Particles to device
Fra:1141 Mem:25279.27M (Peak 26539.95M) | Time:00:06.83 | Mem:0.05M, Peak:0.05M | Scene, ViewLayer | Updating Meshes
```

```
| GPU   GI   CI        PID   Type   Process name                            GPU Memory |
|       ID   ID                                                             Usage      |
|=======================================================================================|
|    0  N/A  N/A    104317      C   ...eir/blender/build_linux/bin/blender       752MiB |
|    1  N/A  N/A    104374      C   ...eir/blender/build_linux/bin/blender       180MiB |
+---------------------------------------------------------------------------------------+
Mon Apr  1 00:40:43 2024
+---------------------------------------------------------------------------------------+
| NVIDIA-SMI 550.54.14              Driver Version: 550.54.14      CUDA Version: 12.4     |
|-----------------------------------------+------------------------+----------------------+
| GPU  Name                 Persistence-M | Bus-Id          Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |           Memory-Usage | GPU-Util  Compute M. |
|                                         |                        |               MIG M. |
|=========================================+========================+======================|
|   0  NVIDIA GeForce RTX 3070        Off |   00000000:06:00.0 Off |                  N/A |
| 52%   53C    P2             30W /  220W |     770MiB /   8192MiB |     10%      Default |
|                                         |                        |                  N/A |
+-----------------------------------------+------------------------+----------------------+
|   1  NVIDIA GeForce RTX 3070 Ti     Off |   00000000:07:00.0  On |                  N/A |
| 42%   57C    P2             80W /  290W |     186MiB /   8192MiB |      0%      Default |
|                                         |                        |                  N/A |
+-----------------------------------------+------------------------+----------------------+

+---------------------------------------------------------------------------------------+
| Processes:                                                                            |
|  GPU   GI   CI        PID   Type   Process name                            GPU Memory |
|        ID   ID                                                             Usage      |
|=======================================================================================|
|    0  N/A  N/A    104317      C   ...eir/blender/build_linux/bin/blender       772MiB |
|    1  N/A  N/A    104374      C   ...eir/blender/build_linux/bin/blender       180MiB |
+---------------------------------------------------------------------------------------+
```

```
    0[|||100.0%|4350MHz|N/A]    8[|||84.2%|4067MHz|N/A]   16[|||83.6%|4341MHz|N/A]   24[|||84.2%|3476MHz|N/A]
    1[|||84.1%|4069MHz|N/A]     9[|||100.0%|4350MHz|N/A]  17[|||84.2%|4065MHz|N/A]   25[|||84.2%|4371MHz|N/A]
    2[|||84.8%|3930MHz|N/A]    10[|||88.2%|4064MHz|N/A]   18[|||84.1%|3932MHz|N/A]   26[|||84.2%|4064MHz|N/A]
    3[|||84.2%|3497MHz|N/A]    11[|||86.8%|3772MHz|N/A]   19[|||84.2%|3497MHz|N/A]   27[|||84.8%|3772MHz|N/A]
    4[|||84.2%|3774MHz|N/A]    12[|||84.1%|4065MHz|N/A]   20[|||86.8%|3774MHz|N/A]   28[|||86.9%|3479MHz|N/A]
    5[|||84.1%|4066MHz|N/A]    13[|||93.3%|4350MHz|N/A]   21[|||84.1%|4064MHz|N/A]   29[|||83.7%|4343MHz|N/A]
    6[|||84.1%|3660MHz|N/A]    14[|||96.1%|4350MHz|N/A]   22[|||84.1%|3660MHz|N/A]   30[|||88.2%|4344MHz|N/A]
    7[|||85.4%|3792MHz|N/A]    15[|||88.1%|4202MHz|N/A]   23[|||84.9%|3789MHz|N/A]   31[|||98.0%|4122MHz|N/A]
  Mem[|||||||||||||||||||||||||||||||||||58.4G/78.5G]   Tasks: 74, 269 thr; 5 running
  Swp[|                                    330M/192G]   Load average: 26.24 21.90 19.91
                                                        Uptime: 2 days, 15:42:20

    PID USER       PRI  NI  VIRT   RES   SHR S CPU%▽MEM%   TIME+  Command
 104317 keir         5 -15 44.9G 26.3G  286M R 2021 32.8  1h29:41 /home/keir/blender/build_linux/bin/blender /home/keir/
 104374 keir         5 -15 51.0G 29.7G  287M R 703. 37.0  2h00:30 /home/keir/blender/build_linux/bin/blender /home/keir/
 104441 keir         5 -15 44.9G 26.3G  286M S 83.0 32.8  2:32.39 blender
 104355 keir         5 -15 44.9G 26.3G  286M S 71.8 32.8  2:32.62 blender
 104363 keir         5 -15 44.9G 26.3G  286M S 71.2 32.8  2:29.53 blender
 104433 keir         5 -15 44.9G 26.3G  286M S 70.5 32.8  2:32.69 blender
 104435 keir         5 -15 44.9G 26.3G  286M S 69.9 32.8  2:36.94 blender
 104445 keir         5 -15 44.9G 26.3G  286M S 67.2 32.8  2:33.05 blender
 104434 keir         5 -15 44.9G 26.3G  286M S 65.9 32.8  2:32.57 blender
 104436 keir         5 -15 44.9G 26.3G  286M S 65.9 32.8  2:27.24 blender
 104440 keir         5 -15 44.9G 26.3G  286M S 65.9 32.8  2:31.27 blender
 104353 keir         5 -15 44.9G 26.3G  286M S 65.3 32.8  2:29.12 blender
 104444 keir         5 -15 44.9G 26.3G  286M S 65.3 32.8  2:32.36 blender
 104426 keir         5 -15 44.9G 26.3G  286M S 63.9 32.8  2:29.55 blender
 104437 keir         5 -15 44.9G 26.3G  286M S 63.9 32.8  2:27.62 blender
 104439 keir         5 -15 44.9G 26.3G  286M S 63.9 32.8  2:30.25 blender
 104351 keir         5 -15 44.9G 26.3G  286M S 62.0 32.8  2:31.96 blender
F1Help  F2Setup F3SearchF4FilterF5Tree  F6SortByF7Nice -F8Nice +F9Kill  F10Quit
```

```
[0] 0:sudo*                                                                 "keirsdesktop" 00:40 01-Apr-24
```

Figure 5: Use tmux so I can run multiple renders and monitor the system without using video memory to load a graphical environment. This means I get faster render times and the render crashes less often, In this image you can see I am rendering 2 instances of blender, on 2 separate GPUs that I select with a python script that I wrote that enables the correct GPU. On the bottom of the screen are the two monitoring tools that I use to check on the GPU and system so I can quickly check that and render is going okay and can answer questions about why a render might be crashing, usually when a GPU runs out of memory.



Zoom causes inconsistent text in nodes #116289

Keir commented 4 months ago

System Information
Operating system: Linux-6.6.6-76060606-generic-x86_64-with-glibc2.35 64 Bits, X11 UI
Graphics card: NVIDIA GeForce RTX 3070 Ti/PCIe/SSE2 NVIDIA Corporation 4.6.0 NVIDIA 545.29.06

Blender Version
Broken: version: 4.1.0 Alpha, branch: main, commit date: 2023-12-15 23:18, hash: `912c4c00d8b3`

Short description of error
When using a particular string the text will change at different zoom levels

Exact steps for others to reproduce the error
Add a node input with the name of "Local Cluster – EPF + Veloity"
Optional - resize the node if all text is visible, I found that adjusting the zoom to after the "F" will cause the visual jump.
zoom in and out and see how it changes the text depend on the zoom level.

Pratik Borhade commented 4 months ago

Hi, thanks for the report. I can confirm the behavior.
@lone_noel might be interested.

Figure 6: As part of the FOSS philosophy I try to give back to the community of people making and using the software I use. Part of that process is finding, diagnosing and reporting bugs. This is not a trivial process as some bugs are not easy to identify the cause, as blender is a complex program that can have a multitude of reasons why something may not work. The next difficult part of the process is being able to replicate the issue in a simple file that you can upload to the blender website with a description of the error and how to reproduce it. I have learnt from being on the forum that being good at communicating your issues will not waste time of volunteers and contributors but also lead to a faster fix. Through this process I have been able to add features to Blender that I need for my work. Shown in the pictures are the bugs I have submitted this year with the conversations with the developers which often is a necessary step on more complex problems that are more difficult to reproduce. But I am very conscious of not wasting their time and being as clear as possible.This is a feature release video for Blender 4.1, at 10:11 a feature that I submitted and explained to developers was implemented into blender 4.1.

5 Inital Plans

*357 - Cells - A Blender Point Cloud Journey

Last year I made a video for an exhibition, in which I planned to use previous videos I made in a job I had in which many of the videos I had made I felt like they where unfinished due to the time restrictions on them. The exhibition consisted mostly of painters and the main theme was landscapes. This influenced my pre-existing plan to redo these pieces. I arranged the most evocative elements from 3 videos with working titles of 3, 5 and 7, through many iterations, trying to find awe-inspiring reveals throughout the video that are composed as landscapes. When animating the camera, I focused on creating a specific view in each area that would form as a landscape. Starting at Leeds city centre, into the motion tracked scene from 3, then, Whitby pier leading onto Malham Cove from 5. The intro and outro are the cell division idea from 7. The video is meant to constantly grow in scale, each consecutive environment is larger and more impressive than the last. Also, the pacing of natural and man-made environments effects the emotional journey, So the film is front loaded with these more structured environments gradually becoming more natural.

This year my plan is to expand on the ideas in this video, as I felt like the first remake could have been longer and more ambitious in its scope. This is what I plan to make this year. This I hope will lead to a more exiting final piece.

Due to my aims for a large project I realised that I needed to use better planning techniques that I'd usually employ. In recent videos released on the YouTube channel Wintergarten, Martin has been discussing the process in which he is teaching himself how to build a better version of a musical marble machine he originally made in 2011. Since then he has been making and failing to make his dreams a reality. But through this process he has been forced to learn concepts like minimum viable products and evaluating parts of the plan that you would normally go with on instinct. This has allowed me to look at the video in a different light and decide how to improve the video with a more concrete plan. The old video contains a motion tracked video of real footage of my girlfriend walking away from the camera, under a tree which I have a point cloud of. This video was initially intended as a proof of concept, so the actual footage isn't that good. The use of the motion tracking also limits the camera start and finishing locations and also adds the camera shake from the real footage which is quite shaky with the equipment I have access to, a gimbal would help me match the smooth camera motion but they are very expensive. So I decided pretty early on to remove this video from the plan, its too different from the rest of the video, you lose the flow and the meditative quality. I am sad to see this technique go, but I think its for the best.

Another major change that I made in result of thinking about the work more deeply was asking questions like - Is it Up High or Down Low? Is it Underwater? What is the Gravity doing? Is it Small or is it Big? What is the size of the space you are in (Reverb)? The question was, what time of day is it? It should be night time, after all my interest with the void and familiar places, there is nothing more familiar but alien at the same time to driving home late at night under orange sodium lights. The void of black outside of the street lights reach apart from the odd twinkle in the distance. I harness This idea and implement it into 357 / Cells, I changed the city scene to night time, with a long exposure effect on the car headlights.

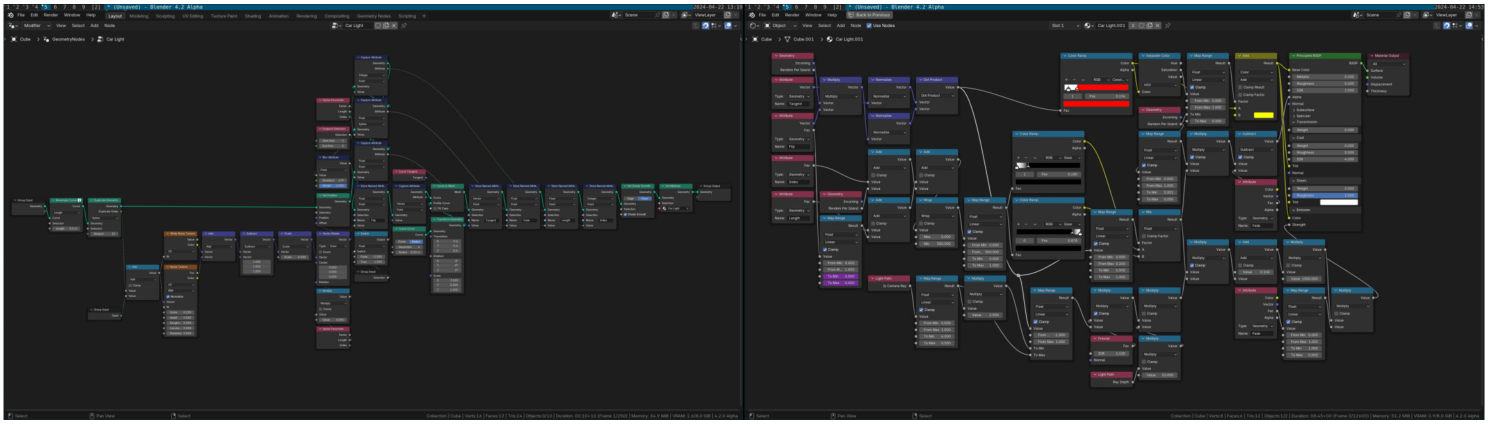


Figure 7: These is a node tree and it is how I achieve many different tasks in blender, they are simple blocks of code that I can build into complex systems, there are nodes for shaders, how things looks, and nodes for geometry, a more fundamental system where you can procedurally manipulate the structure of the object you are working with. These two node graphs work in tandem, one to generate lots of car head lights from simple curves I manually place, and another to colour this generated object to glow red or white and move like a car does. The curves was modelled by hand to match the curves of the road, and matched with a shader that showed red or white lights depending on the 'direction' of the cars. This had to be done in a 'faked' manner, as I discovered Blender does not support motion blur on lights, so this look of long exposures had to be achieved in a 'fake' manner. Interestingly this is not just a limitation of blender but all renderers that work in the same way as blender, so this is a problem that many artists have solved in the past, the technique I used I found through researching VFX shots.

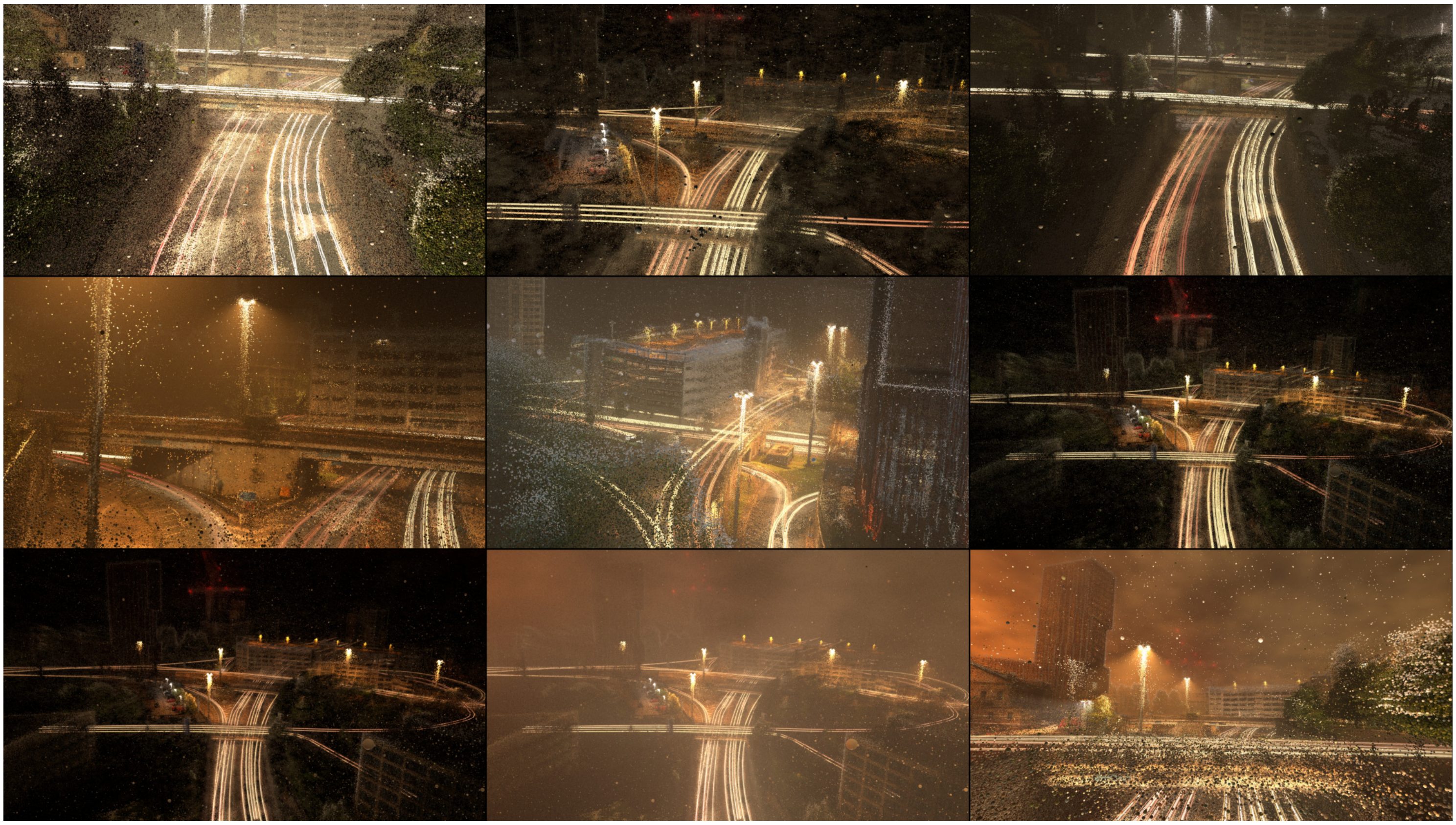


Figure 8: Test Images of Night Time City with car head lights. This is one of the first locations in the old video so i started with that, implementing the car lights and then placing individual lights onto the point cloud where lights exist in real life. Then I can have motivated lighting, not just a glowing point cloud in a void, but with lighting with an atmosphere and a more seamless integration into the world around it. Here I am testing different fogs and brightness of the lights truing to find the sweet spot of familiarity and attempting to find the beauty in this motorway

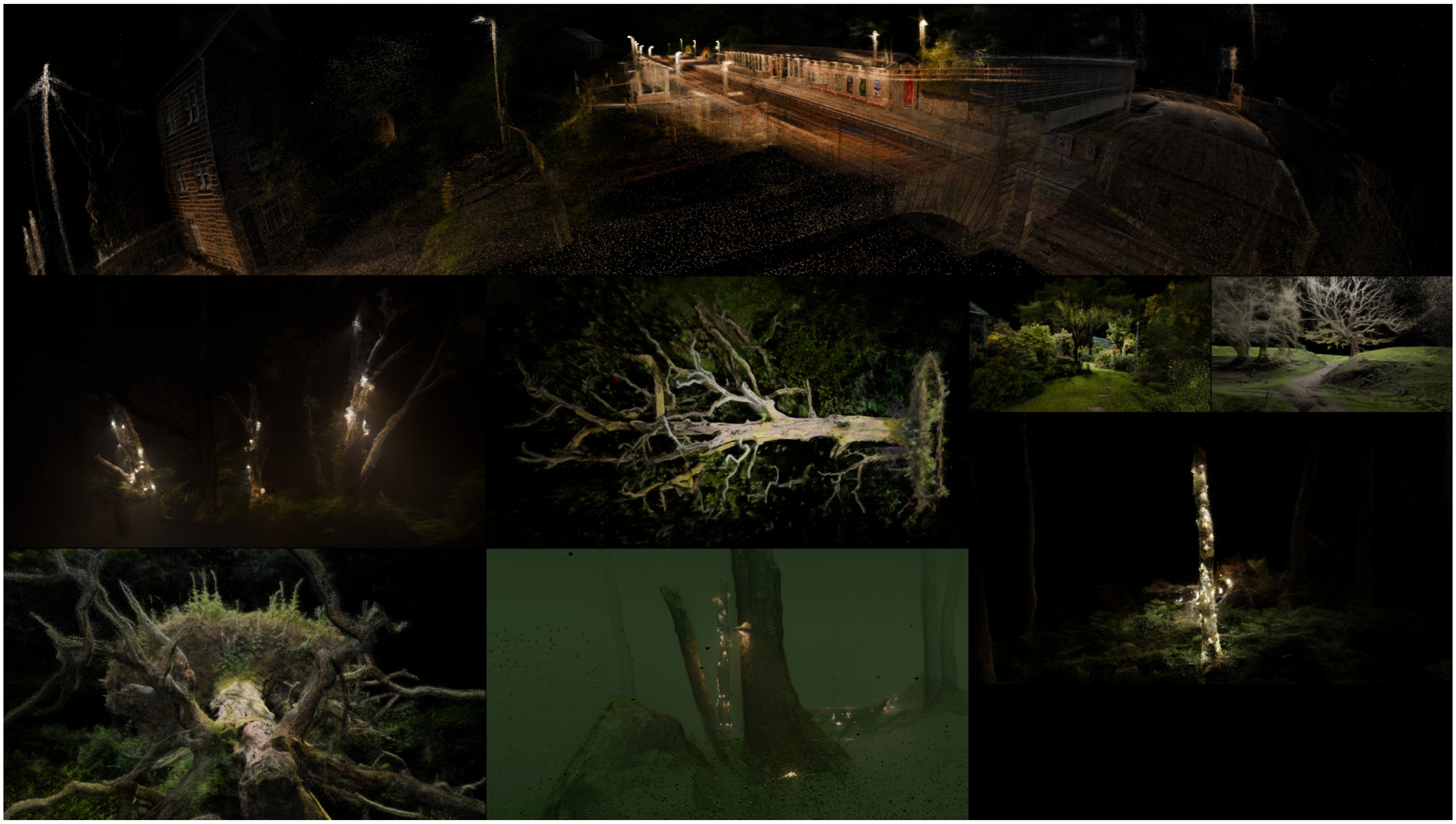


Figure 9: After I finished changing the city I started working on these mushroom trees that I had recently captured along side Horsforth train station. I struggled to find many other good ideas of how to implement motivated lighting other than placing lights inside of mushrooms, in a childish and magical way. I learnt that if I wanted to have lighting in the scene, there must be some kind of motivation for that lighting. I did some brief research into motivated lighting in film, where often the lights are off scene, and the motivation is in the imagination and realism. The other images are just other point clouds that I was experimenting with at the time, finding camera angles and finding inspiration for the video and thinking about how I could combine scenes so I could have motivated lighting for the entire scene, using motivated lighting from on point cloud to light another point cloud.

6 Degree Show Environment Plans

In second year I had an exhibition in House for an art lover made me think about experimenting with designing a better frame for a project mapped work. In a perfect world I would have a room that a person could walk inside of, with a perfect representation of my work surrounding them. I have seen this done in a square room by zombieblazer who learnt about point cloud from my videos. However square rooms have their limitations, there is a level of immersion lost in the corners. A more ideal shape would be a hemi sphere. There are a couple of commercial solutions for this problem like Planetariums. However, since my discovery if being able to view it from both sides of the projection screen, I have investigated fabrication methods like geodesic domes allowing to build a lightweight structure and cover it with a thin sheet, this could be projected on from the top and sides.
Datascapes - Live Recording - zombieblazer

I have gone through many iterations of how I would like to project my work at the degree show. As projection is a complex process I planned to work out the technical side before designing the environment of the room. I started looking into 360 dome projection, it still seems like the most seamless concept I have as it would allow viewers to move around the room and actually run around to see different bits of the video. I also came across the concept of half dome mirror projection, where you project from inside of the room onto a mirror dome, which then reflects the image all around the dome. However due to the issues around projection like occlusion and uneven pixel distribution when projecting onto curved surfaces, rear projection was the only method I could find and that would require at least a 10m x 10m space, which was impractical for the show. It wasn't until the show at dream machine and the video by zombieblazer of his 3 walled video installation that I actually believed that 3 walls was all I needed. So I went off to test for that plan and what environment I wanted.zombieblazer is an artist who found me through my YouTube channel, as he was commenting on my videos, I checked out his channel to find that he is doing a MFA and also makes Point Cloud videos and through talking I found out that it was my work that inspired him to try make point cloud videos. His video lacks quite a lot of what I aim for as the content is honestly boring and only really is interesting to me as there is little work made in the same way as mine. However, the installation seen in this video is really exciting for me to try with my work.

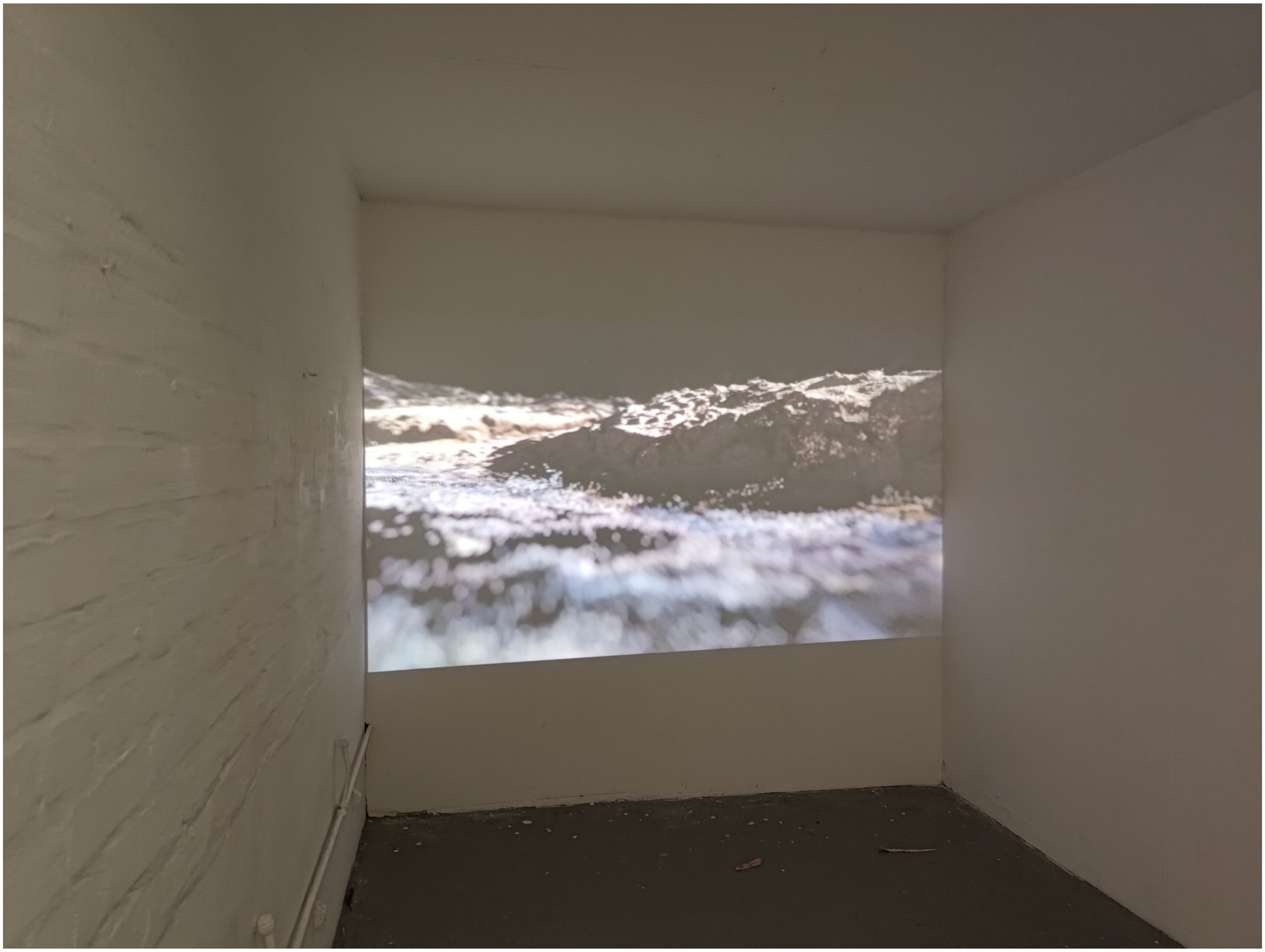


Figure 10: Testing Projecting to the edges of a wall. I was in two minds about the glow caused by projection. If I was to have multiple projectors in this room, the corners would be overly bright, it is pretty in moments but not immersive. This test is where I first found the troubles of the GSA projectors. I hired 1 short throw projector and 1 regular projector. The image you are seeing is the long throw, it has a much nicer image quality, but to make an image this large, it was placed outside of the room. I couldn't fit another projection on the left or right since there isn't enough space to get a large enough image to fit the wall.

Here is a plan of all the ideas of different places that could be inside of the room that fitted my themes. I also made columns for the wall, floor and carpet as these elements where needed for a thorough examination.

Place	**Back Wall**	**Floor**	**Ceiling**
Spaceship	Flight Desk / Seats	Carpet Cushions	Buttons Switches
Narnia Wardrobe	Wardrobe and Coats	Wooden Coats	Wood
Save Room - Resident Evil	Table with Type Writer	Tables Chairs Dust	Anything
Elevator	Black Paint, or match other walls. Elevator Door.	Carpet Tile Buttons imbedded.	Mirror
The Space Between Walls	Brick Wall	Rubble Dust	Black Paint Wood Plaster Board
Under The Floor Boards	Brick Wall	Plaster Board Dust	Plaster Board
Mirror	Black Paint or Mirror	Black Paint Mirrors	Black Paint Mirror
'The Library'	Bookshelves	Carpet	Anything Dark
Alice In Wonderland	Mushrooms Underground Under a Tree	Dirt Woodland	Leaves Roots
A Cellar In a Top Floor Flat	Stairs Leading up	Anything	Vaulted Ceiling

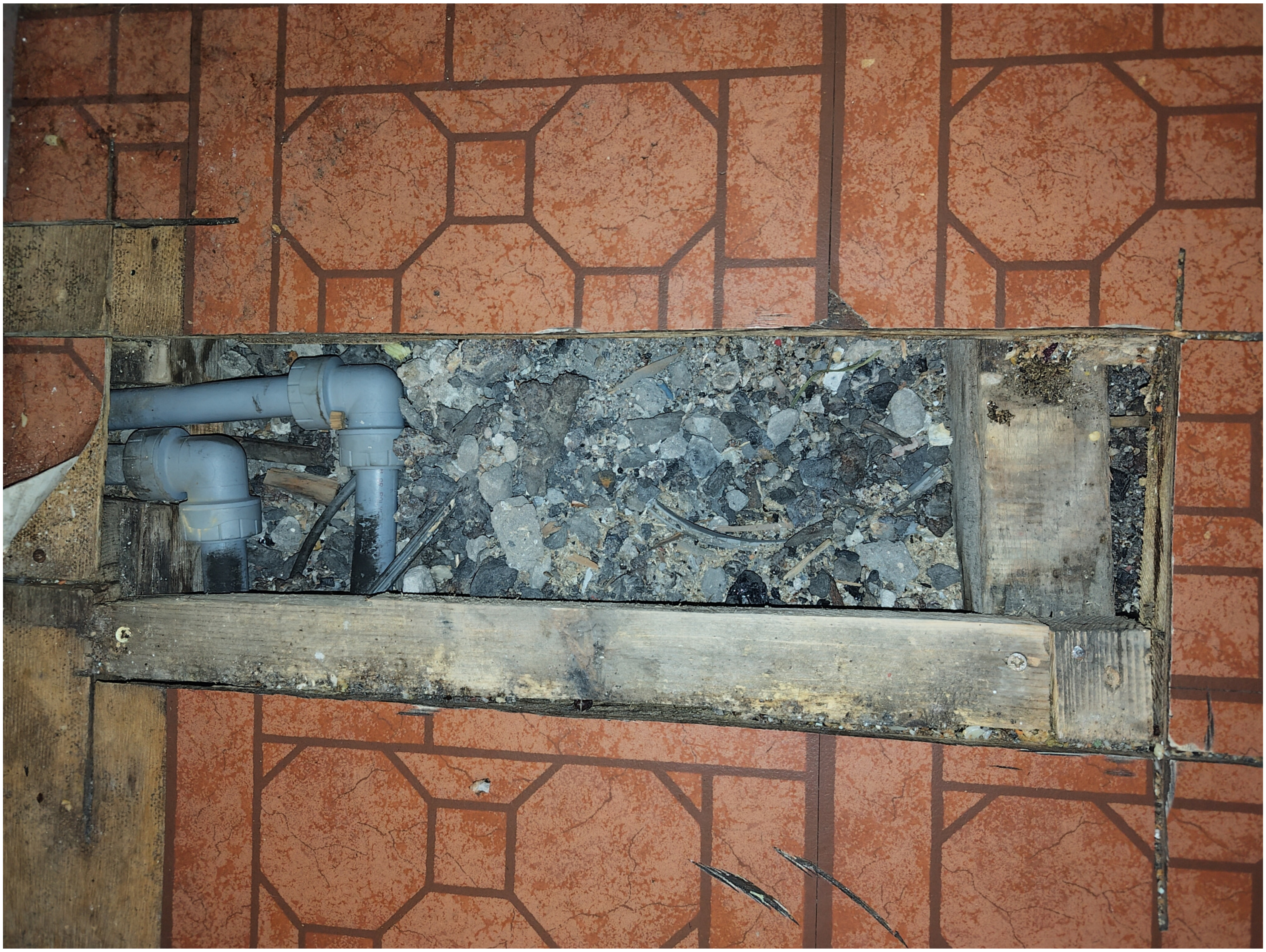


Figure 11: I explored the places I wanted to make, finding the detail in references. Having the pipes in really would sell making this environment. Underneath my floor boards seems like a interesting place to explore. But I learnt that to make some of these ideas to a high level of realism would be very difficult. I don't think having floor boards on the ceiling would be able to look like a giant scale with very large and wide boards of wood, since things like the wood grain would not change scale. So most of these miniature ideas don't really work for the time I have.

6.1 Elevator Plans

I have chosen to create an elevator as it seems one of the strongest and achievable ideas I had. I had worries about ideas like under the floor boards, being too complex to create the environment to a quality I would be happy with due to the scale change. An elevator has a few decorative elements I can add but it is still mostly a room. Here are the plans I have so far for each element.
Flooring

- Carpet Tile Flooring.
- Dust on the floor Gathered from stairwells.
- Soft flooring like a mattress, adding a surreal and dreamlike quality and providing seating, which was one of the more complex parts of the elevator design.
- Use black and yellow striped tape to indicate the sitting area.

Buttons

- The buttons need numbers or labels(under the clear plastic).
- Scattered about the room with a main console near where people are sat.
- Need to look magical or ornate, not plasticity.
- Could Wire them up for video start - confirm to start video - doesn't work because you need all 4 people to start it.

Door / Gate

- Elevator scissor gate.
- Multiple elevator doors that don't open side by side like a lobby.
- More than one layer of elevator door.
- Felt on the inside of the scissor door or have an extra felt curtain before the scissor door.

Projection

- Projector of choice is the Optoma GT1080.
- It has a low brightness at the distance I want, However it is the only projector that will be able to work from inside a room at this scale.
- 63 nits - therefore I need very low ambient light.
- Throw Distance: 1.49m. This is the middle of the room, so therefore all projectors cannot be on top of each other, there needs to be a weird design to make this work.
- Height : 169cm. Width: 300cm. Diagonal: 344cm. Center of projector is -27cm outside of the image.
- Use Projection Mapping to make the projected image too large and slightly crop to the final wall dimension.
- Use a Gray Wall for more neutral and natural contrast and deeper blacks and less global lighting.

Mirror

- Mylar blanket vacuum formed to make large mirror.
- Use plexi glass for protection - too expensive.
- Use clear coat spray paint?
- Maybe melamine for flat surface to form on.
- Find a Glue for the blanket to stick to the board.

I have also made a detailed mock-up in Blender of the environment using the measurements I have made.

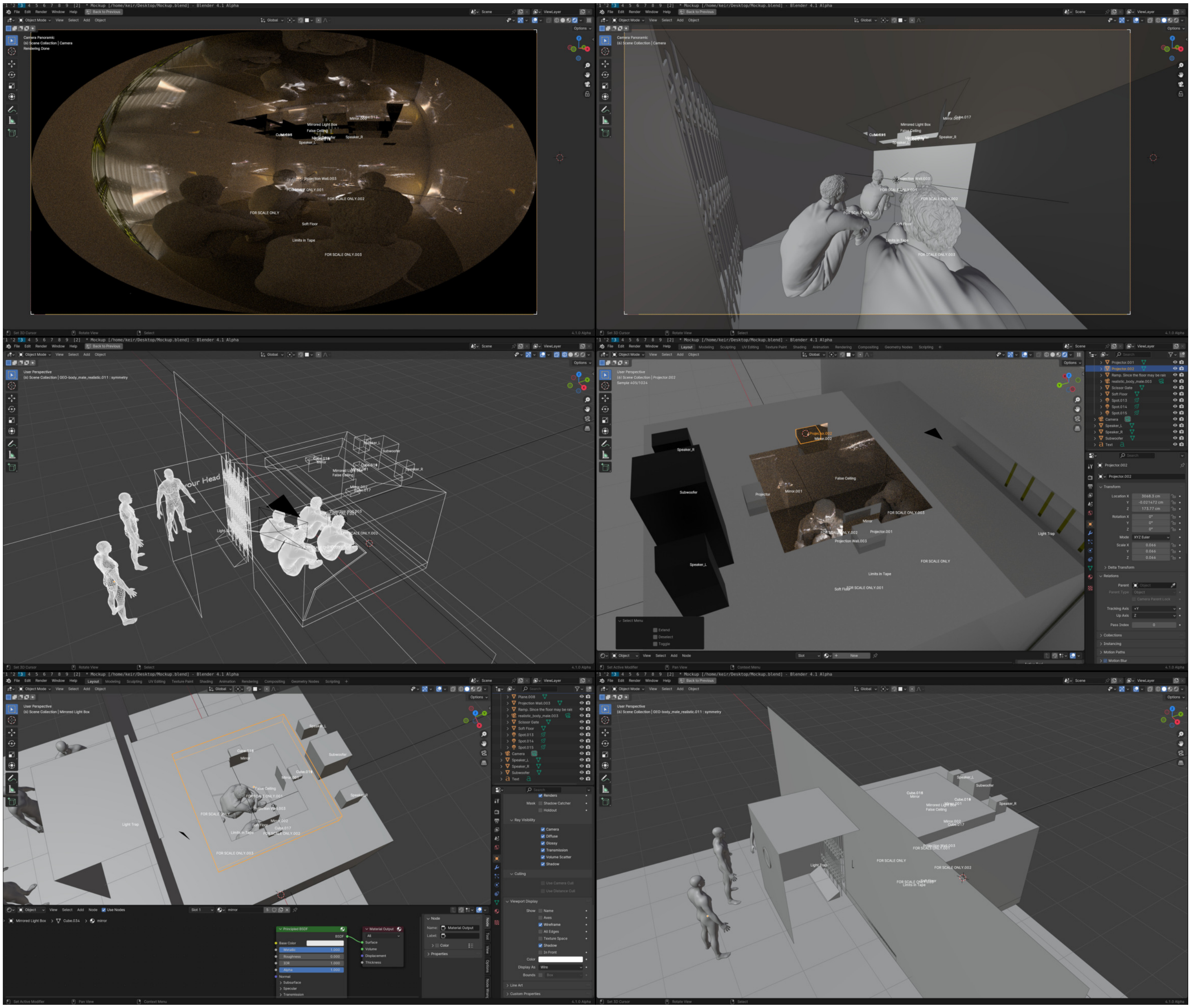

Mirrored Light Box
False Ceiling
Speaker_L
Speaker_R
Subwoofer
Projection Wall.003
FOR SCALE ONLY
Soft Floor
Limits in Tape
Light Trap

Figure 12: This mock-up was made in blender to try experiment with projection options and how people in the space may block the projection. I was struggling to imagine the space and the people in it so using real scale humans sat and stood allowed me to visualise this. For this projection idea I would hide the projectors in the ceiling, and due to their offset projection (I found this on a projector calculator website that gives dimensions for projectors) the image would appear below the ceiling on the walls. This mock-up also allowed me to see details that I would need to make, for example, the soft flooring I wanted would mean there would need to be a ramp in the door way.

6.2 Work Towards Elevator

- The journey should be once of grounding. Moving to simpler and smaller places, bringing you back down. Start with the awesome and end with the mundane, the house to relax and feel safe.
- Return to the elevator multiple times.
- Have a looped long section in the elevator.
- Like in the film Inception, their is an elevator that holds a characters memories, in the film we only catch glimpses some of these scenes, it would be interesting to try that as I want to explore how the viewer experiences scale when they only partially see things.

- At the start, we are in a elevator, we travel down faster and faster till it is a blur, sounds are loud of a elevator falling and splashing into water, only to stop, the doors open, we are underwater and we see a single cell floating in the void, cell division beings.

Audio

- Tim Hecker is known for linear ambient music, I want to harness this quality, make ambient music that has a definite direction.
- To improve the audio from 357, the audio can move from individual bloops from the cell, like in 357, to the wild noise of a song like windowlicker that was used in the film 'Climax' by Gaspar Noe. The song plays as a raw, screeching, buzzing mass of emotions and seems like the journey I want to take people on.
- Go to a few elevators in the city and record the sound of the journey to the top floor.
- Use a subwoofer in the installation to create the vibration and feeling of an elevator moving. Hopefully since the audience will have no frame of reference, they will feel like they are moving if we provide them the sensation that they are.

Hard to implement

- Blend from point cloud to expanded radius to nerf to guassian splat.
- Scanner Sombra, a video game that uses point cloud style visuals. You keep the points you have already 'scanned' and cannot see anything you haven't, meaning that there is a sort of persistence of vision to the visuals, this would be interesting to experiment with.
- Arms and legs seen in the camera of the viewers perspective, like that of a first person video game.
- A Voice talking from the 'minds' perspective, seen in Fight Club and games like Disco Elysism
- While looking for houses for this year I found lots of 3D models from online house viewings. I thought it could be a interesting source to work from, the unobtainable house in their millions.

Easy to implement but require a video rework

- Manifold Garden a game that is heavily inspired by Escher. There are infinite copy's of the world around you. You also have the ability to change the direction of gravity and fall to one of these 'copies'.
- A Cellar In a Top Floor Flat.
- A point cloud Placed in White Space, seen in the game Nier Automata.
- The Video contains the room of viewing.
- Move up and the start and the end of the video.

Good Questions to ask when making each section

- Is it Up High or Down Low.
- Is it Underwater.
- What is the Gravity doing.
- Is it Small or is it Big.
- What is the size of the space you are in (Reverb).
- Are We inside the elevator or floating, we should only move vertically when in the elevator.

I want to look at elevators / lifts as a transient and liminal space. They are a space we are voluntarily trapped in for a brief period of time with complete strangers. There is a silent comradery in a elevator. To be teleported, transported vertically, through the guts of the building to reach a higher place, to only use them again, to take us back down. I want to look at this journey through meditation and relaxation. Or even day dreaming away the walls of the elevator, leaving only you and your fellow passengers together on a journey. The elevator is also a critique of the white cube, as people come and go in gallery spaces, maybe watching some of the end of a looping video to wait for the beginning. they leave at different times, they get off on their floor, with a different perspective on the work.

The surprise of the opening of a elevator you've never been on before, a new floor, you may glimpse at passing floors as strangers leave.

You believe that an elevator moves, you can only sense it in your stomach when you jerk to a halt. Its movement it imperceptible.

Since you do not exert energy in a elevator, it is a place of rest. The alternative it to take the stairs.

At the start, we are in a elevator, we travel down faster and faster till it is a blur, sounds are loud of a elevator falling and splashing into water, only to stop, the doors open, we are underwater and we see a single cell floating in the void, cell division beings

Video games use elevators in a meta-physical manner, by saving or loading the game, the elevator becomes a place of safety. and a place that will take you to a new area, a new mission. Elevators divide game worlds up, separating areas from one another. There is no way between the two areas other than the elevator, it is the signal of progress, the sign that your heading on the right track, that you've found the key, pulled the leaver, that you've bettered yourself. An elevator in a game is often a place to hide secrets, due to the slow and momentous movement, game developers provide interest and story telling along the route of an elevator. In video games elevators are a place of wonder and awe, revealing new areas and vistas. Games do not need to use logical elevators, they do not need to follow the rules of physics. They are magical floating platforms, mysterious mechanisms and the mundane office elevator. Sometimes the inside of the elevator doesn't even exist, just existing as an imaginary space while you teleport to your destination. Elevators often lead you to a foe, but as often lead you to treasures. They are a neutral space that takes you somewhere polarised. There is a scaffolding elevator in the school. Can i record the sound or even photograph the elevator.

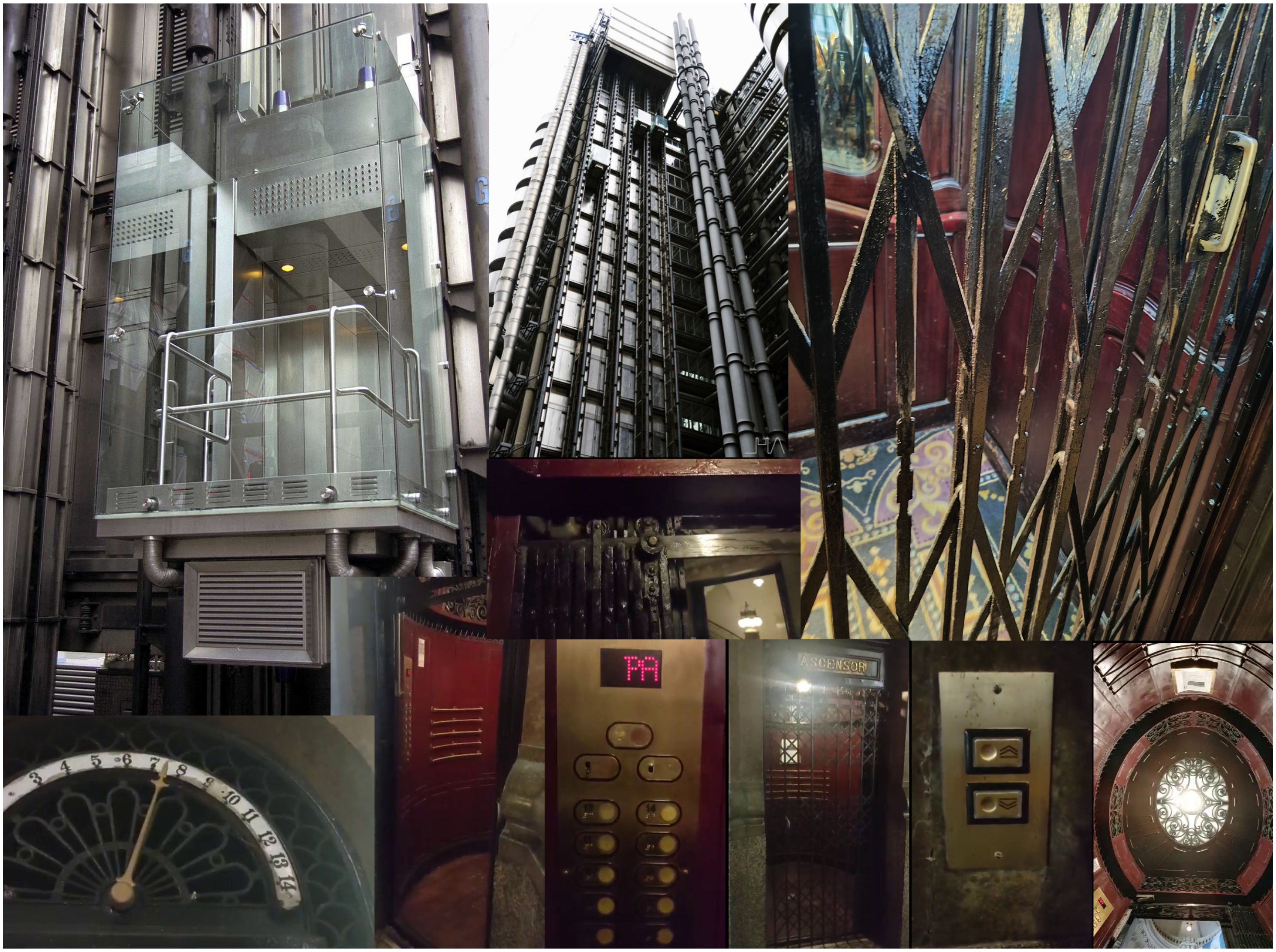


Figure 13: Elevators on the outside of the Lloyds Building designed by the architect Richard Rogers, an old scissor gate elevator said to be the oldest elevator in Glasgow in the Wetherspoons in town and a old elevator my friend found in Buenos Aires. These are some of the elevators I looked at for construction methods and ideas about lighting, having a floor number on the outside of the room and having self illuminating buttons inside the room with floor numbers on.

6.3 Elevator Doesn't Work & Technical Projection Experiments

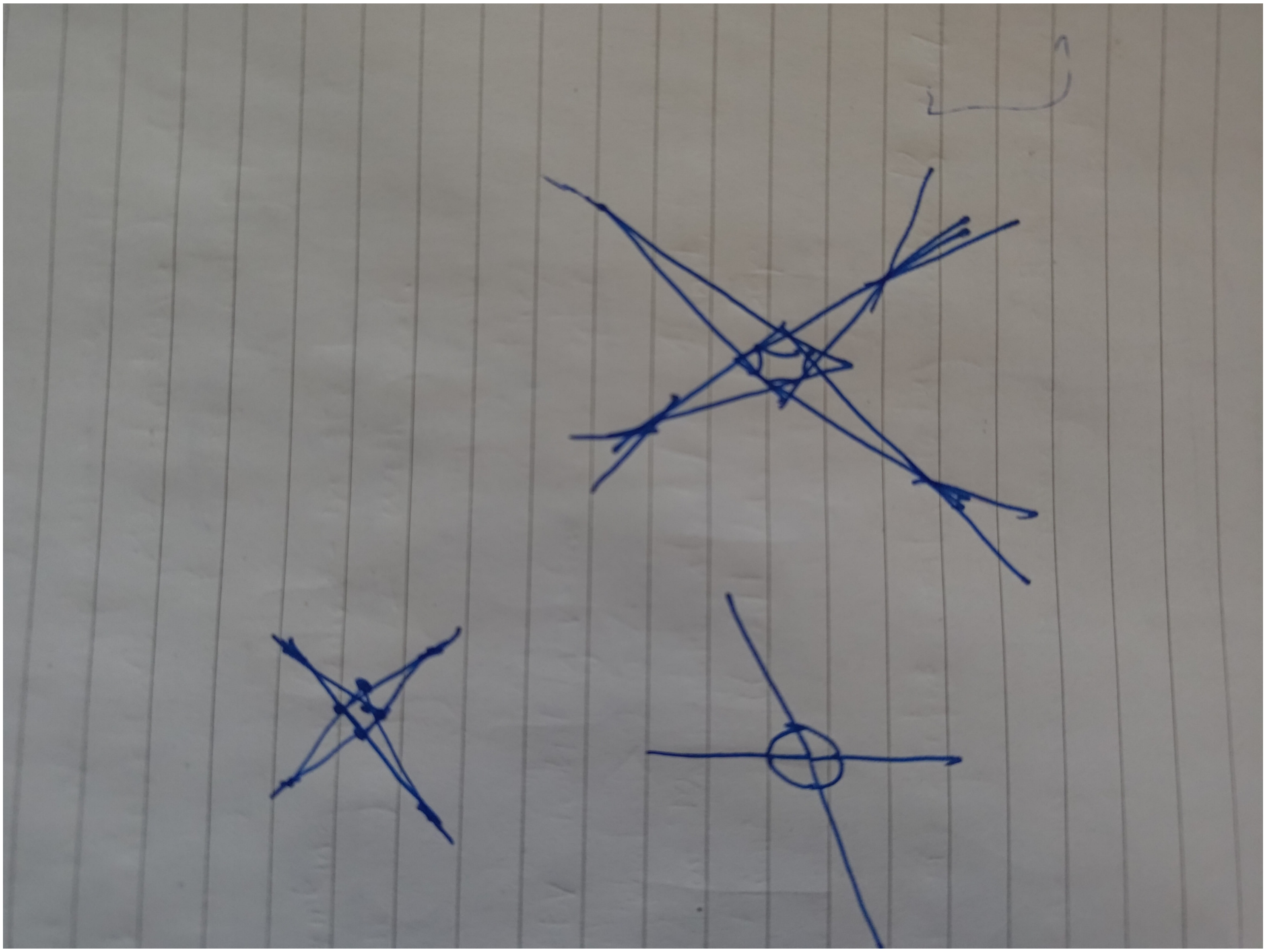


Figure 14: Looking at the shape of the projectors themselves, they might be able to tessellate together, so I can situate all projections near the center of the room and project outwards onto 4 walls. Rendering for this projection idea was also quite confusing to wrap my head around, In this diagram I learnt that there was no way to have 4 cameras that match on each edge having continuos vision, where the cameras where pointing inwards. 4 cameras looking outwards will loop correctly. And even more confusingly I believe you can use 4 outward looking cameras for both direction although looking outwards is the only method that will be physically correct. In the looking inward model the will be a non-euclidean nature to the image, which interests me that there is something impossible about the render itself. These methods allow me to use outward looking cameras for all renders from now on as I can use either direction depending on what equipment I get.

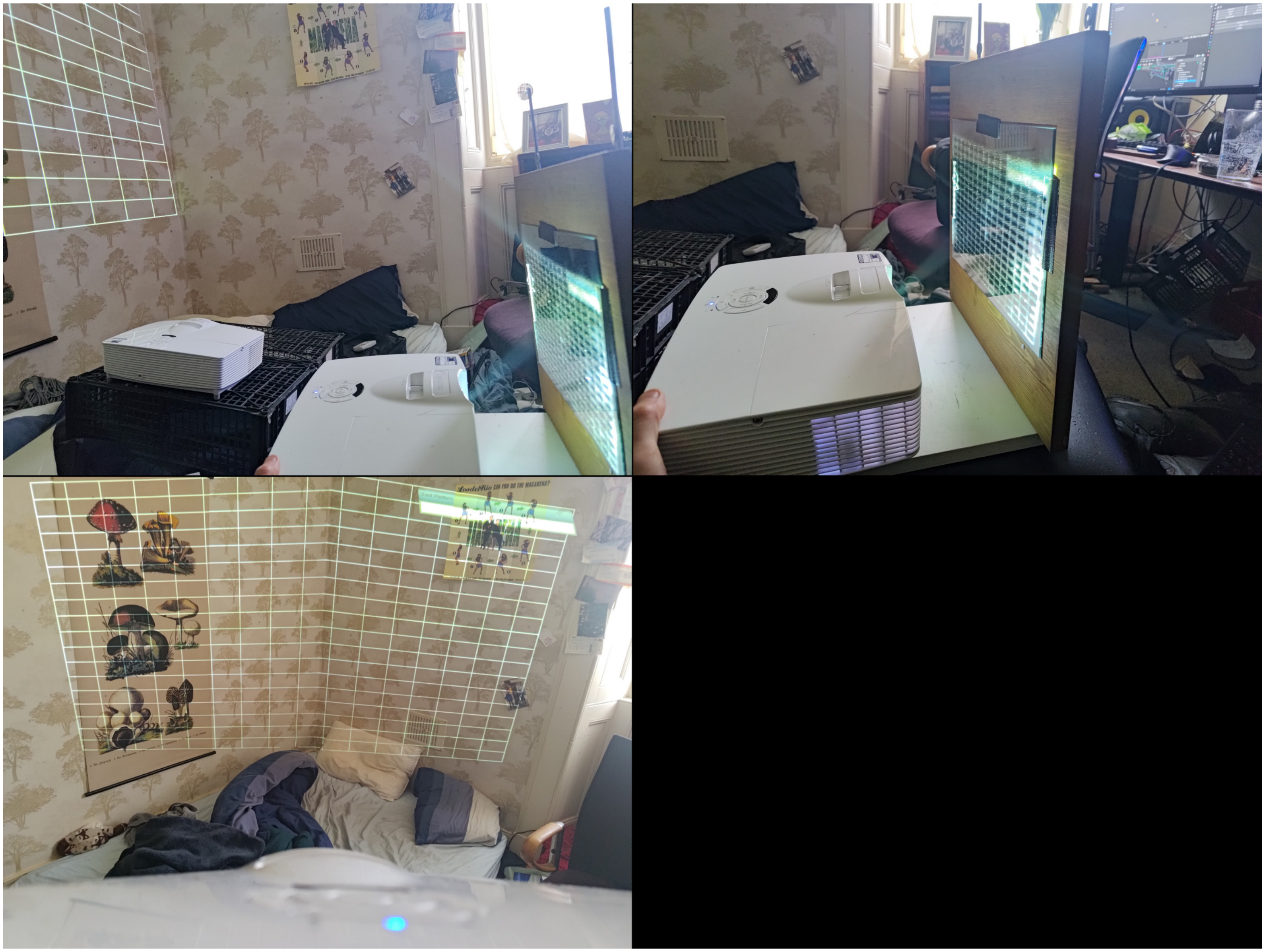


Figure 15: To try figure out other projection methods, I attempted to study how using a mirror may avoid having to tessellate the cameras together as I discovered the projectors themselves would have to be inside each other to project a large enough image. No matter which way you arranged them, they would block the light from the opposite projector. I thought by using mirrors I would be able to 'fold' the light into a short path, However even though in these images it works as intended, It still has the same dimensional issues as the first method of tessellation, but this time with the mirror itself, due to the projectors I was using had a 0.5 projection ratio, the image gets twice as large for how far the throw is from the projector. This means you need a massive mirror is the projector is far away. The mirrors would all have to sit inside on another to achieve this, all edges of the mirror would collide with the adjacent mirrors.

After this discovery I had a talk with Arron in the media suit, he had seen my emails with Harald who also had been helping me work through these ideas. He agreed at this point that the projectors that the school had could not make a 360 degree projection in the space that is given to students for the degree show. He left me with a few options. Use monitors / TVs maybe combined with a single projector, VR or look for sponsorships. I had ideas along the lines of an expanded display, projecting around a large TV to make it even larger but less detailed, I have seen similar concepts where people place LED strips around the edge of a display that almost extend the display, but this idea could be even more detailed. I would just have to projection map out a rectangle black mask where the TV was placed and display a larger render. I also had ideas around placing multiple monitors asymmetrically around the room, almost like the vehicle I was planning on making the space early on in the process. I have many thoughts for the use of VR, here are some. As explored in 'Stream Highlight: Late Night Rambling about VR and the Resolution Limits of the Human Eye' by Dan Olsen there are multiple problems and roadblocks to the proliferation of VR. When discussing an interactive 3D environment in VR we have issues of resolution, frame rate and the scale of environment that is explorable. Resolution and frame rate must be maximized to trick the human eye into believing it is real, or users may experience motion sickness or other side effects. The same goes with the exportability of current VR, we are limited to the physical size of the playing area we are in, VR experiences are often limited to a few meters square. This means to explore a digital space that is larger than a few meters wide, players must teleport or use another function to traverse larger distances, that all lead to more motion sickness. This is before we get onto the limited access to such devices and the hassle of wearing one. ‘There is a contradiction between the length of time these experiences have to be due to motion sickness, and how much effort it takes to put on the headset’ I believe that virtual reality (VR) or a similar technology is going to be powering the immersive experiences of the future. While it is true that VR is still a relatively new and emerging technology, it has the potential to provide highly engaging and immersive experiences for users, as well as to enable new forms of communication, education, and entertainment. I recognize that there are still many challenges to overcome in order to create truly seamless and immersive experiences with VR.

In the meantime, I think that 360 videos are one way that some industries are exploring immersive experiences in the short term. I appreciate that 360 videos can provide a more immersive experience than traditional videos, as they allow the viewer to look around and explore the environment in a more interactive way. However, I understand that 360 videos are not truly interactive in the same way that VR is, as the user is still limited to a fixed perspective and cannot interact with the environment in the same way. But it does allow for traditional video to be used rather than a fabricated 3D environment.

Overall, I believe that both VR and 360 videos will play a role in the development of immersive experiences in the future, but I think that VR may ultimately offer more potential for truly interactive and immersive experiences. I am waiting for further adoption, lowering costs and potential multi-user technologies of VR. Given the current processing requirements, one high end computer is needed per headset, this means that large scale multi-user environments, where the experience could be experienced simultaneously are incredibly expensive. When these things are feasible, I can imagine many interesting explorations to be made, but at the current moment it seems to be a tech demo.

Additionally, there is a lot of research available on virtual reality (VR) and its potential applications in the art world, including in the areas of communication, education, and entertainment. Some notable references in this area include ‘Virtual Reality in Art Museums and Galleries’ by Sarah Kenderdine and Jeffrey Shaw, and ‘Art in the Age of Virtual Reality’ by Oliver Grau. ‘The Virtual Reality Casebook’ by Kenneth E. Barner and ‘Virtual Reality and the Built Environment’ by Philip Crowther.

Even though there are all of these technical problems with VR the main limitation for me is the simultaneous viewing experience of multiple people. In a perfect world we could put a headset on and disappear from reality, but our thoughts remain, we are worried about taking up too much time, or if you look stupid with the headset on. You cannot experience the art with the people around you.

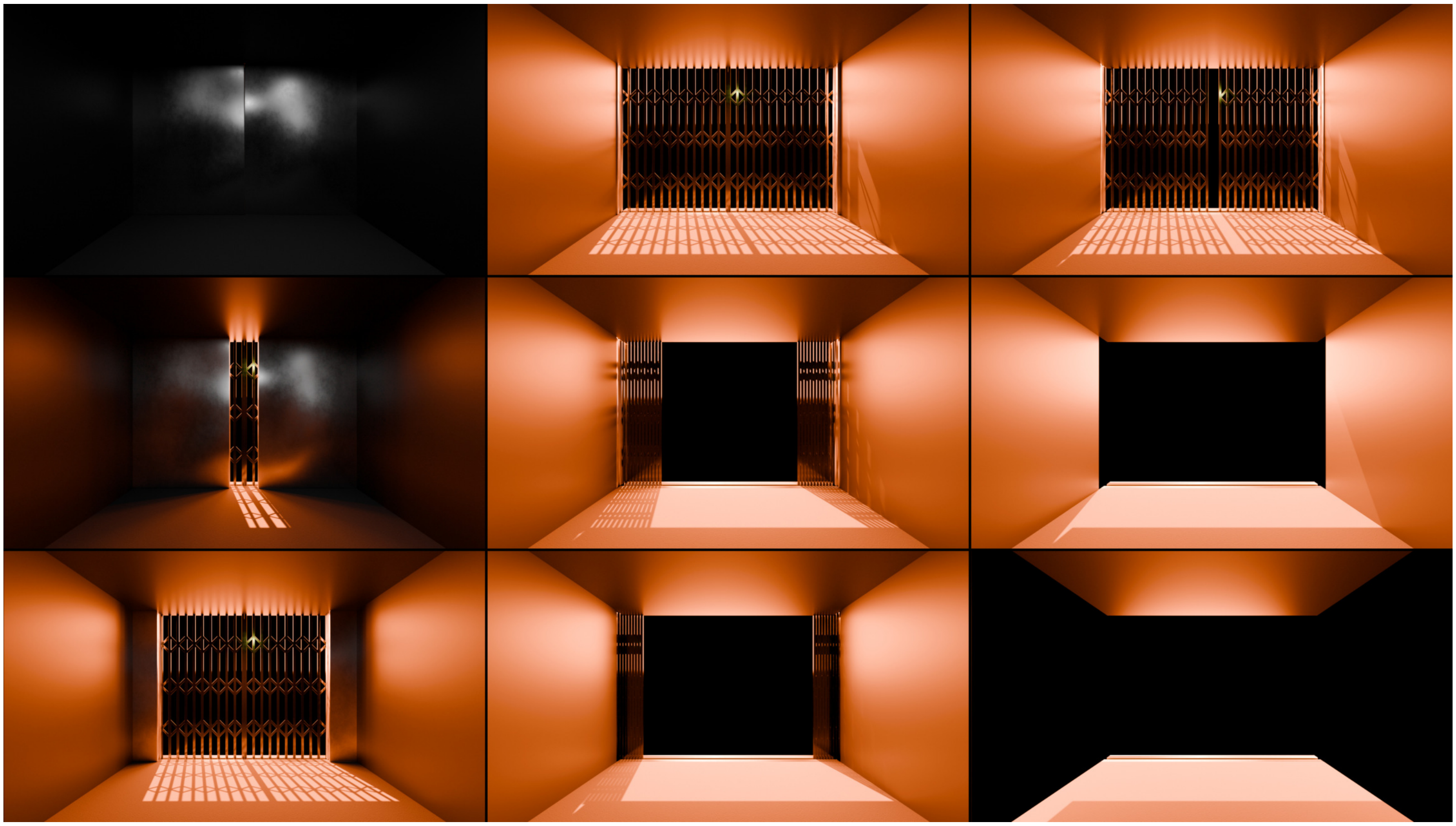


Figure 16: This is a animation of some elevator doors I made, I wanted to have multiple layers of new and old styles, as a surreal and collaged element. A change from the familiar just enough to feel intriguing. The animation and rigging of the old style elevator took some time, but eventually I figured out that I just needed to copy one element and offset from a certain point many times to produce the effect. I tried to animate the sounds of the elevators, I tried to imagine what sounds that type of elevator made and think of what how that would be seen, in a small judder or a stickiness to the movement. I also animated the walls 'opening' after the doors open. This was so the whole video could be from 'inside' the elevator, there would be a physicality and continuity throughout the video.

7 Proposals and Sponsorships

Due to my worries about getting the equipment I needed from the media suit and I was worried about the amount of time it would take to render multiple high resolution videos, so I may need more rendering equipment, I made letters to send out to companies in hope for getting a sponsorship. I briefly looked into the cost of render farms but they would be close in cost to buying the equipment myself.

These are some of the companies I emailed/visited their shops and gave them a letter: Looking Glass, LG, Samsung, Warpaint, Dell, Richer Sounds, Curry's PC World, PNY, ASUS, Nvidia, MSI, EVGA, Gigabyte, Multiple small independent shops around Glasgow and Leeds. As well as sending the letter to family and friends to pass out at work.

This is an example of one of the letters that I sent off to various companies:

Dear ...

I am a digital artists who captures and collages 3D scans. I am going to create a highly immersive environment to break through the proverbial screen. I make digital art that engages with themes around the void, and memories, using photogrammetry as my paintbrush.

Here is a link to my work, there are more videos on my YouTube channel.
https://youtu.be/HGKQqVoCgzs - 00:04:04
https://youtu.be/FAXRcyPiuMU - 00:01:24

I am in my final year studying Sculpture and Environmental Art and this is my opportunity to show my work to its full potential. I have been limited by the equipment that Glasgow School of Art has. I am inquiring about the possibility of being sponsored for my Degree Show at Glasgow School of Art.

Choose one of the following.

My plan is to use 3 projectors to make a 270 degree projection room, floor to ceiling. Ultra-Short throws are the only way I can achieve my goal in the space requirements set by the school, this is what I would be requesting from you, to loan me three Ultra-Short throw projectors.

My plan is to make a 270 degree experience with 3 Large screens to wrap around the audience. The school does not own any screens at the size or quality of yours, they also cannot provide me more than 2 monitors. This is what I would be requesting from you, 3 of your large OLEDS.

I plan is to render a high quaility 4K video with large particle simulations, I cannot afford the equitment needed to render such a project.

I will need the equipment as soon as possible to the 10th of June. In return I would be more than happy to advertise your products with flyers or posters as well as the display of your technology, promoting your products through my art.

The video I will be showing is currently in production so I will be able to send a final version sooner to the show.

If you have any further questions please feel free to get in contact through this email or my phone number which is: 07900852020

Thank you for your time and consideration.

Cheers,
Kind Regards,
Keir

I was offered a RTX4080 by PNY and an old server from Balfour Beatty, a contact my father found through work. The server had lots of RAM, so it was perfect for the simulations I was working on. The 4080 was a transformative effect on my renders, increasing speed up t 2 times. Both companies where happy to sponsor me with the equitment as long as I needed it. This was amazing news.

8 DIWO

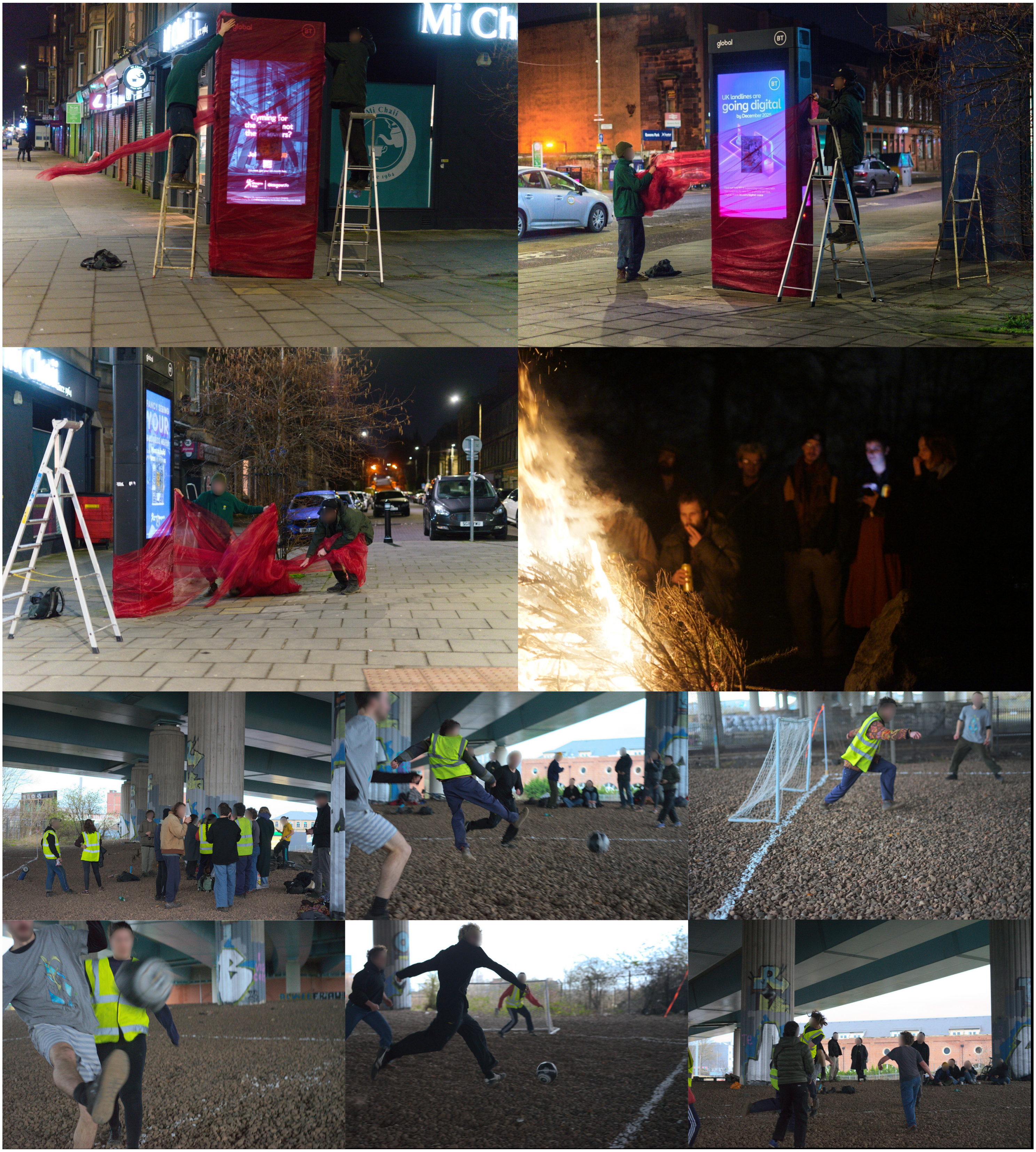

Mi Ch
global
UK landlines are going digital

Figure 17: I have joined a artists collective called DIWO. Here is a short selection of some photos I have taken at DIWO events.

I had a couple of crits and a meeting with Dave Sherry, a visiting artist, and a few individiual tutoirals this year. I have learnt that these interactions are very positive, however, they usually lack any true critism or a deep enough understanding about techonology to be able to discuss the process. So I have had to find these conversations elsewhere. Attending exhibitions, documenting, collaborating and curating. I have been a photographer for a football match under the motor way. I been a photographer for a installation on Victoria Road. I was a technical assistant and photographer for a exhibition in Queens Park as well as organiser. We had a challenge of taking the video of the inside of a fire. We had ideas with mirrors which non of them worked, then we came across a wireless camera, like a baby monitor, which we could sacrifice while we saved the video remotely. I placed this inside of a Pyrex container to expand its life while still allowing it to see, We tried not to seal this as a worry for condensation. This also took quite a complex network setup to be able to record the video remotely which was achieved with 2 phones connected via a hotspot, one phone to the camera, and the other to the internet. I put on a exhibition outside of McNeil's as part of DIWO. I put on a joint exhibition with 2 other DIWO members in our house. I was part of a DIWO fundraiser gig in the Old Toll Bar where I performed over 5 hours of VJing as well as helped set up the gig. Official documentation can be found here * In the gig I used DWM to display the work, this is what I use to on my computer as my windows manager, it allows rapid window changing and arranging so I thought it would be a interesting tool for VJing, also this was a really cool experiment for me to perform my work live. I played off the music that the DJ was playing, implementing strobing sections, flicking back and forth between videos, and collaging layer upon layer of different videos. I also did timed elements where I found I could match up the cell division to the bpm of the song, a technique I recently got from learning how to mix records.

9 Point Cloud Capture

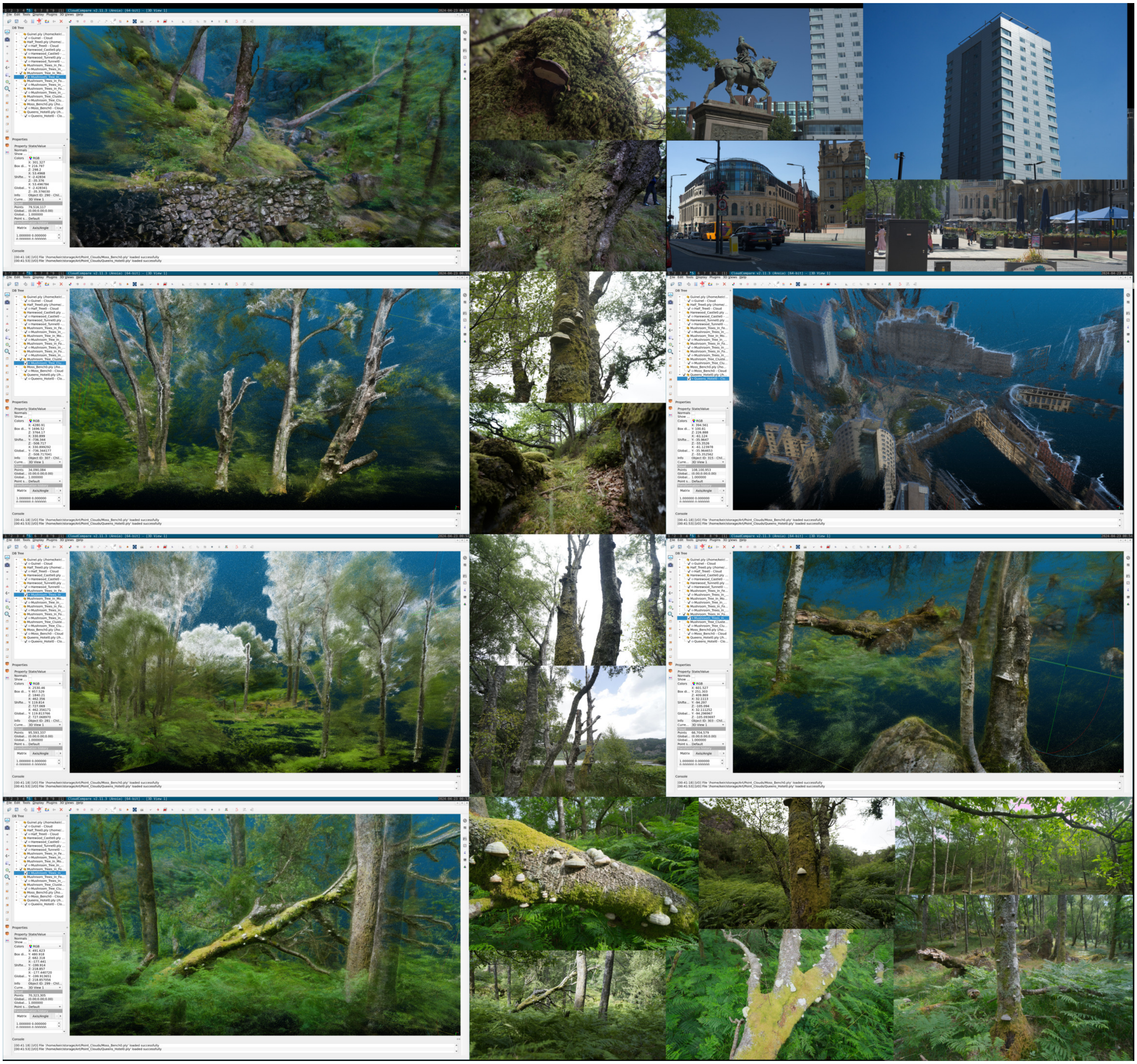


Figure 18: Here are a small example of some point clouds I have captured this year with some respective photographs that I used to generate them. I used around 500-2000 photos per point cloud, if in doubt always capture more so you don't miss anything. The mushroom trees where captured with the idea of arranging them in a magical bioluminescent collage. Inspired by visuals seen in Avatar and Nausica. The mushroom trees where all captured on the same trip, all with the concept of putting them in the void. Even with elements like firefly's illuminating the branches and the mushrooms glowing shining down. The large city I captured in hopes to expand the original city section in the original video as it felt quite small and not as engulfing as I had hoped. This however, was quite a difficult capture as there was so many people and cars. My process needs an unchanging scene to accurately capture everything. To try mitigate this I took multiple pictures from the same perspective to allow for cars and people to move slightly, showing what was occluded by them moments ago.

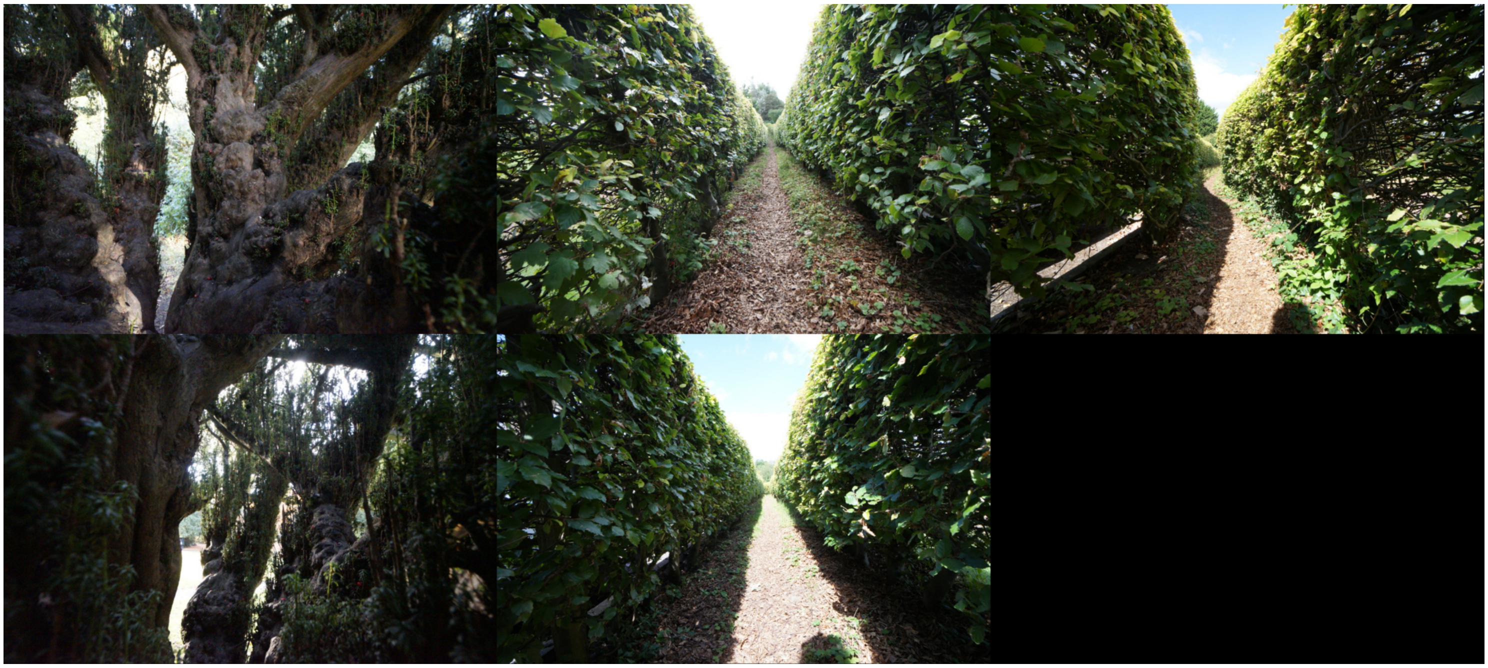


Figure 19: These are some more technical challenges I have tried this year and have failed. In the left photos, you can see a very fine detail of the inside of a Yew Tree in Queens Park. These elements where too fine to capture on a wide lens, however it was very difficult to use a larger lens inside of the tree as it was already very hard to climb and capture at the same time, to get all the angles I needed with minimum motion blur. The same problem existed for both these captures of a bright and changing sun on the days I tried to capture them. This means there is a large variance between shots

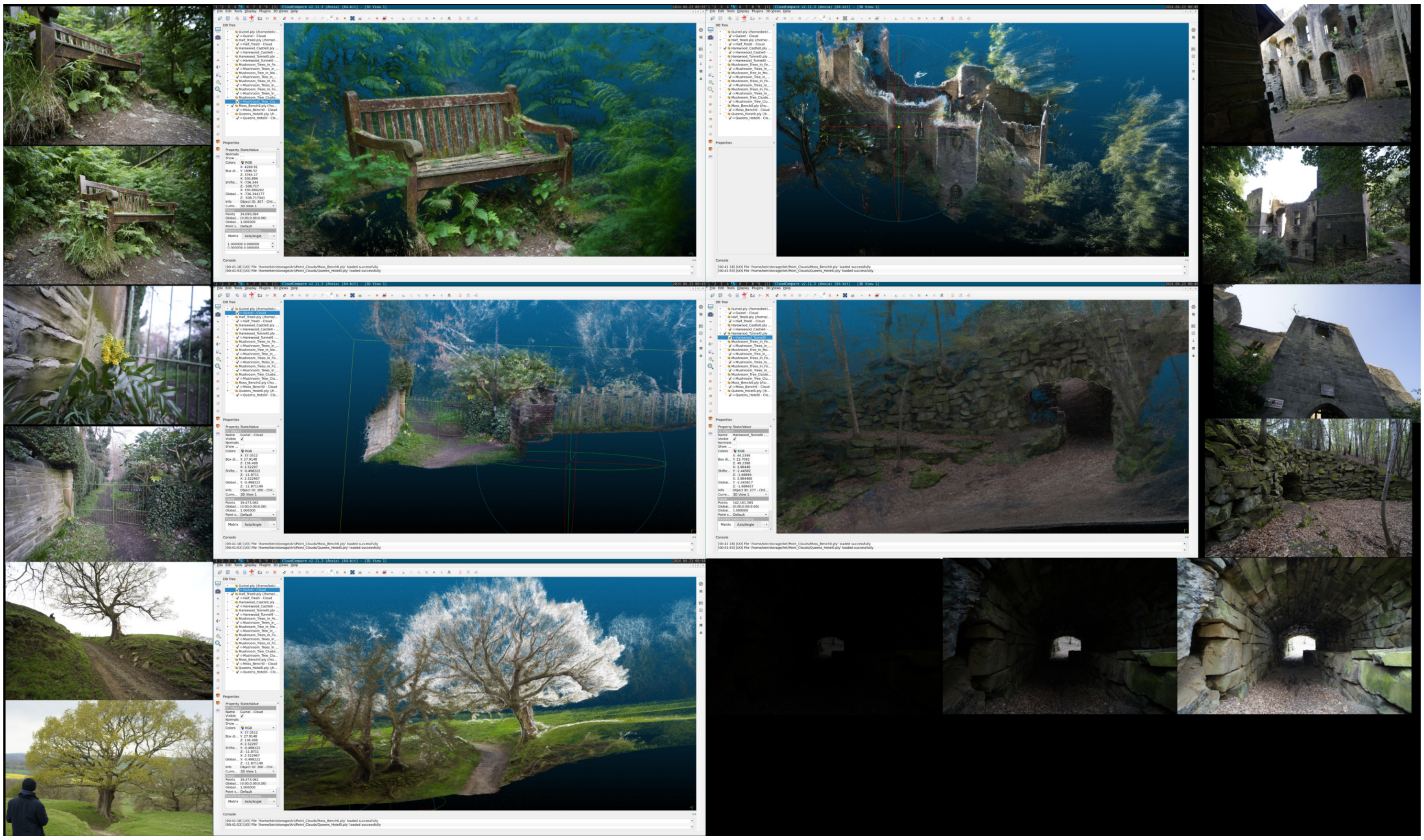


Figure 20: This next group of point clouds I captured as a response to the remake of the video, I wanted to find a transition between the urban and rural to the green trees and magical landscapes. My main area of improvement can be seen in the bottom right. Since there was so much dynamic range between the light and dark areas of this scan, I decided to experiment with bracketed image where the camera would capture different exposure levels, allowing for a much more detailed point cloud especially in dark areas. Another discovery I made is in point cloud filtering. I use a program called CloudCompare which allows me to delete or merge points based off different filteres. I always thought that the statistical outline filter gets rid off noise in a way that took away from the raw point clouds natural noise. But it isn't actually bad its just needs a computationally lots of points to determine what are actually outliers. I used this to create cleaner point clouds that still retain the natural point cloud noise.

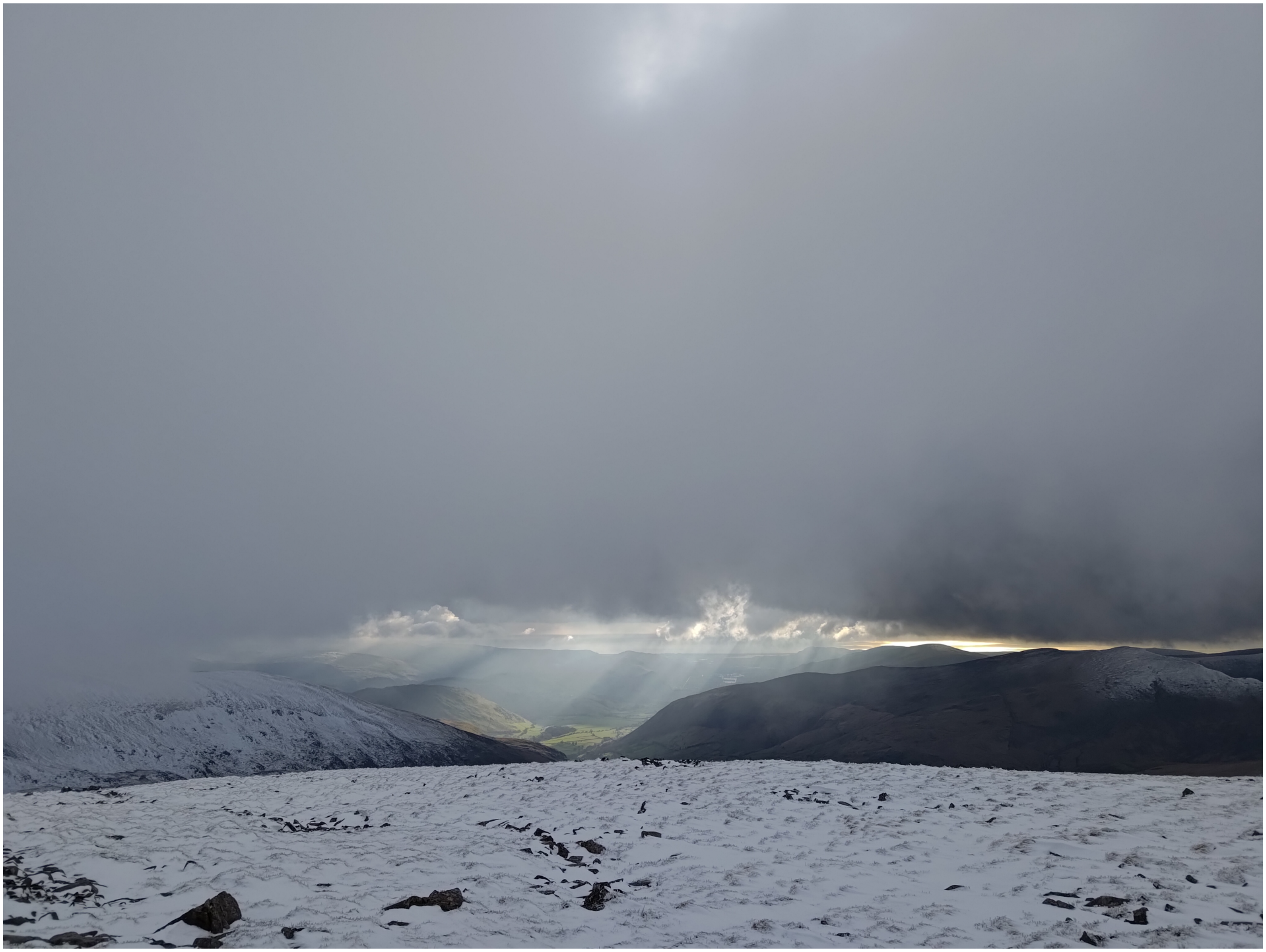


Figure 21: I go on many walks and adventures and try to photograph these vistas, not to look at again, but to experiment and find what makes a vista, what makes a view. How does your eye move across the environment and how is the scene lit that makes it so beautiful. This is one of those pictures that I take. I have learnt over the years that this is a crucial part of my practice, I need to immerse myself in these environment to experience and see how atmosphere and lighting can change a space. Like in this photo, It is really good reference to try recreate this kind of cloud and sunlight.

10 Getting Started

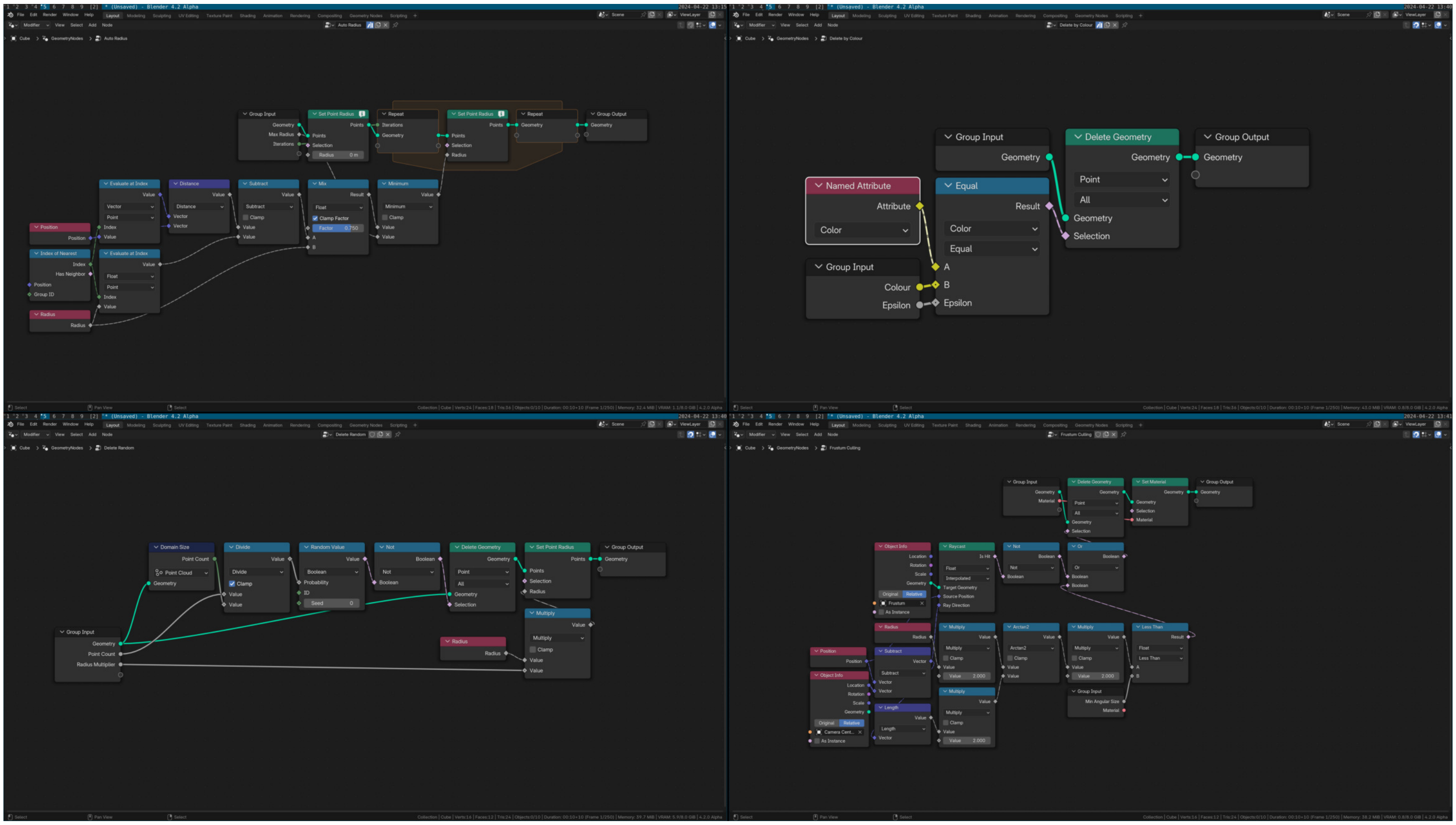


Figure 22: To work with so many large point clouds I had to develop tools that I could reuse to process and display the point clouds. These evolved over the year as I noticed I was needing to perform certain repetitive tasks. In the top left is a Auto Radius tool, I made this to automatically find the maximum size a point can be without overlapping with another point. This gives the most legible result, there is also a maximum point size that I can manually set which limits how large the point that are floating in the air can get. For each point it finds the points neighbour and the distance between them. Using this information it can iteratively find the largest size a point can be without overlapping with its neighbour. I started this process after learning about how NeRFs work, they create ellipses instead of points, filling in gaps between points. So this gives a more dense look, but also controls the areas of detail by not covering them up. The top right tool is quite simple, it allows me to slowly find colours in the point cloud that I want to delete. When capturing point clouds it is hard not to get fringing on the edges of objects often next to the sky, so blue outlines appear everywhere. With this tool, I can select the actual hue of blue and remove all points with that hue, as it would be impossible to remove them manually. Since you often get ‘bleeding’ from the edges of object with the background, objects next to the sky will have a blue ‘halo’ around the edge. This saves a massive amount of time as I don’t have to manually delete these blue areas to make it seem more light night time. The bottom left tool is used mostly in the creation process, it allows me to generate a lower level of detail point cloud which dramatically quickens process’ inside of blender. The final tool is the most complex seen here, it is a Frustum Culling tool, this is what made this project possible at all. It is a combination of a frustum culling and angular size culling system. This means that points that the camera cannot see will not be rendered this gives me ability to render a order of magnitude larger scenes with more points. There is also a angular distance calculation that removes points if they are very small, taking into consideration there distance from the camera and the points radius. This tool was applied to all point clouds. I developed this after seeing a Unreal Engine demo of their new system called nanite that works off the same basic principles but at a more complex level.

What is the journey I want to take people on? I want to start at the city and move to more natural areas. I want to find what worked about the original video and extend it. I started with making written story boards, listing the different point clouds I’d like to use, mainly mentally visualising the different feelings of travelling from one place to another. Some elements I’d have to test in Blender and then alter the story boards based on if something actually worked as intended.

10.1 Story Boards

Notes and Story Boards Notates this was added later in the process	Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Harewood Castle Michaels House Half Tree Whitby Pier Fallen Tree Nadezdas Caravan Abandoned Petrol Station Eastmore Reformatory Moss Bench Blossom Tree Malham Cove Sand Stream Kitchen Mattress Rose Street Kitchen Window Worn Tree Cell Simulation (Currently Almscliffe)
Original Video. I liked the Blossom Tree over Dry Dock. I Liked Malham Cove to Sand Stream	Cell Simulation (Almscliffe) Dry Dock Michael Blossom Tree Whitby Pier Malham Cove Sand Stream Cell Simulation (Partial)
1 Expand the city section, so you are in that environment for longer with Queens Hotel, Horsforth Station and Abandoned Petrol Station, slowly transitioning to a smaller and less intense location. The other locations didn't work very well, there was no path that you could visually follow between the locations.	Dry Dock Bridge Queens Hotel Horsforth Station Abandoned Petrol Station Michaels Garden Eastmore Reformatory Nadezdas Caravan
2 I found the Dry Dock to Horsforth Station transition, using a bridge to blend between the two areas very effectively. I started collaging the mushroom tree point clouds I have, inside of queens hotel, as the street lights looked like the mushrooms I had made. Harewood Castle was captured for this transition out of Queens Hotel, it works well, I was just not sure how to leave it.	Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Harewood Castle Michaels House Half Tree Nadezdas caravan
3 I experimented with how we would get back up, above the places we have explored, to look down on them retrospectively, but the journey I have designed keeps leading us lower and smaller. I did this with Whitby Pier and the Fallen tree, using the Pier to lead us up a path inside the tree trunk, which looms over the city below.	Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Harewood Castle Michaels House Half Tree Whitby Pier Fallen Tree

4 Put the Half Tree inside of Harewood, so now we go into the castle, and their is a tree. It felt natural that Nadezdas Caravan was after the Half Tree, down the path in the darkness. Inside Nadezdas Caravan I started to make the work more surreal, placing the moss bench in a physically impossible place.	Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Harewood Castle Half Tree Nadezdas Caravan Moss Bench Green House Eastmore Reformatory
5 I couldn't find a good path into of Eastmore Reformatory, so I tried to use Harewood Tunnel as a transitionary place, 'between the walls', of the Greenhouse and the Reformatory, but once I tried that, I found that the Abandoned Petrol Station felt like a rest bite area, to fill up the tanks before setting of for the rest of the journey.	Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Harewood Castle Half Tree Nadezdas Caravan Moss Bench Green house Harewood Tunnel Abandoned petrol station Eastmore Reformatory / Fliss' Stairs
Eventually I decided to not have a seamless edit for the Cell Simulation, this was partially due to planning restrictions, as due to Blender technicalities, it was impossible for me to have them in the same location. Also I felt like since it was such a internal piece now, things could exist as an emotional preamble to the video. I also added an extensive section leading you towards Harewood Castle, as I felt like the suburban areas were missing so far, these helped transition. I didn't like how we left the Abandoned Petrol Station so, decided on Whitby Pier being the soul point cloud to get us above the city, where we can see Malham Cove and Sand Streams in a sort-of heaven.	SelfInBed* Dry Dock Bridge Horsforth Station Queens Hotel Mushrooms - Collection Bridge* Gate* Guinel* Harewood Castle Half Tree Nadezdas Caravan Moss Bench Green house Harewood Tunnel Abandoned petrol station Whitby Pier Malham Cove Sand Streams Gravity Simulation

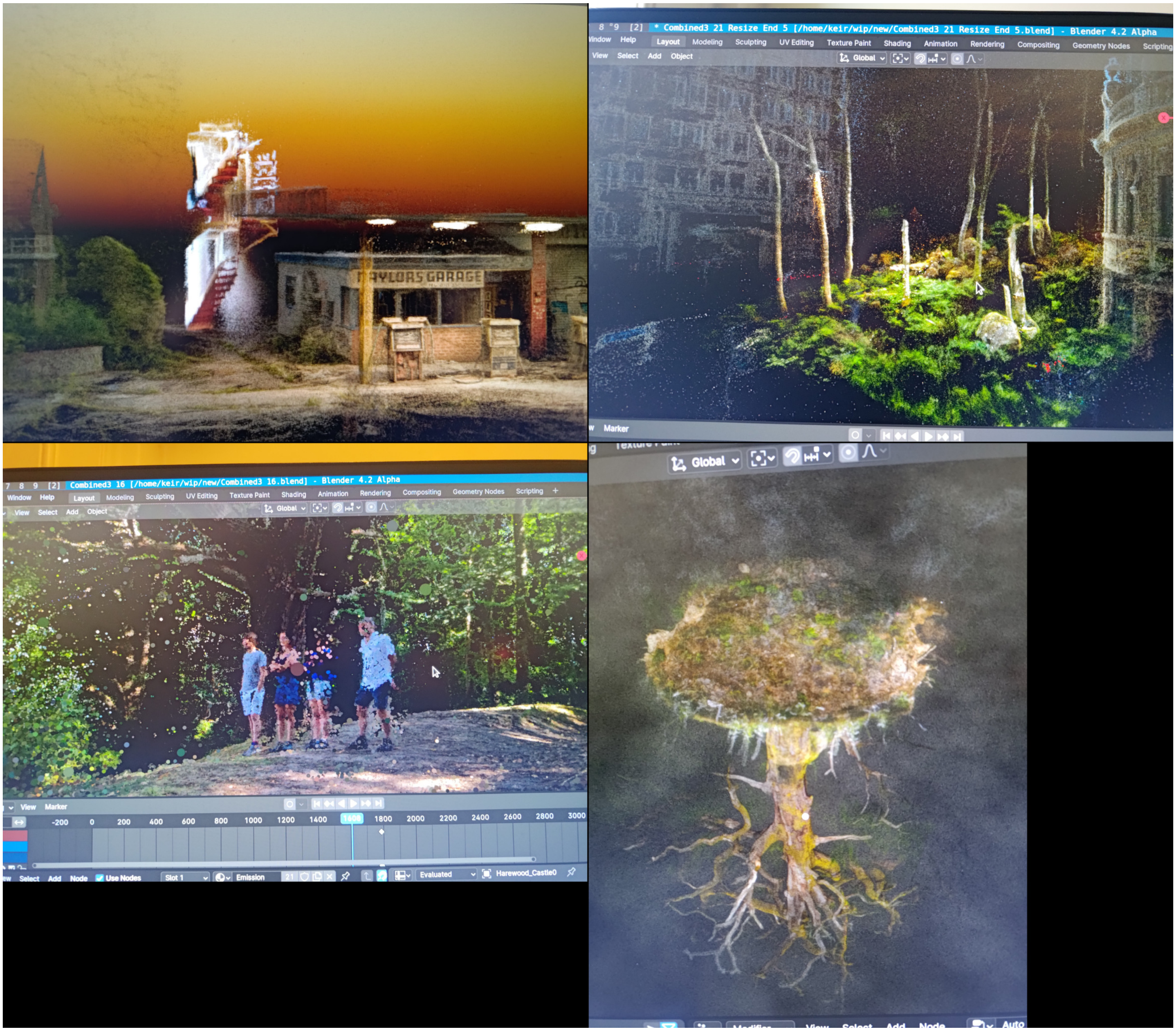

TAYLORS GARAGE
* Combined3 21 Resize End 5 [/home/keir/wip/new/Combined3 21 Resize End 5.blend] - Blender 4.2 Alpha
Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Geometry Nodes Scripting
View Select Add Object
Global
Marker
Combined3 16 [/home/keir/wip/new/Combined3 16.blend] - Blender 4.2 Alpha
Window Help
-200 0 200 400 600 800 1000 1200 1400 1800 2000 2200 2400 2600 2800 3000
Select Add Node Use Nodes Slot 1 Emission Evaluated Harewood_Castle0
Auto

Figure 23: These pictures show a fraction of the different layouts I tested, for example this is one of the decisions that went behind these layouts: People are often around when I capture my work, my close family and friends, so when it comes to making the video I have often wondered about removing the people and what their relevance was to the video or even why they may distract the viewer from the organic and still environment, normally devoid of signs of life. But it was through understanding my work as a literal story about myself, the places I have been for the last few years and the people who are around me, I have captured a digital version of my experiences so the people around me are part of it. This is helped by never fully capturing the people and having them as background elements that are disintegrated and half-formed

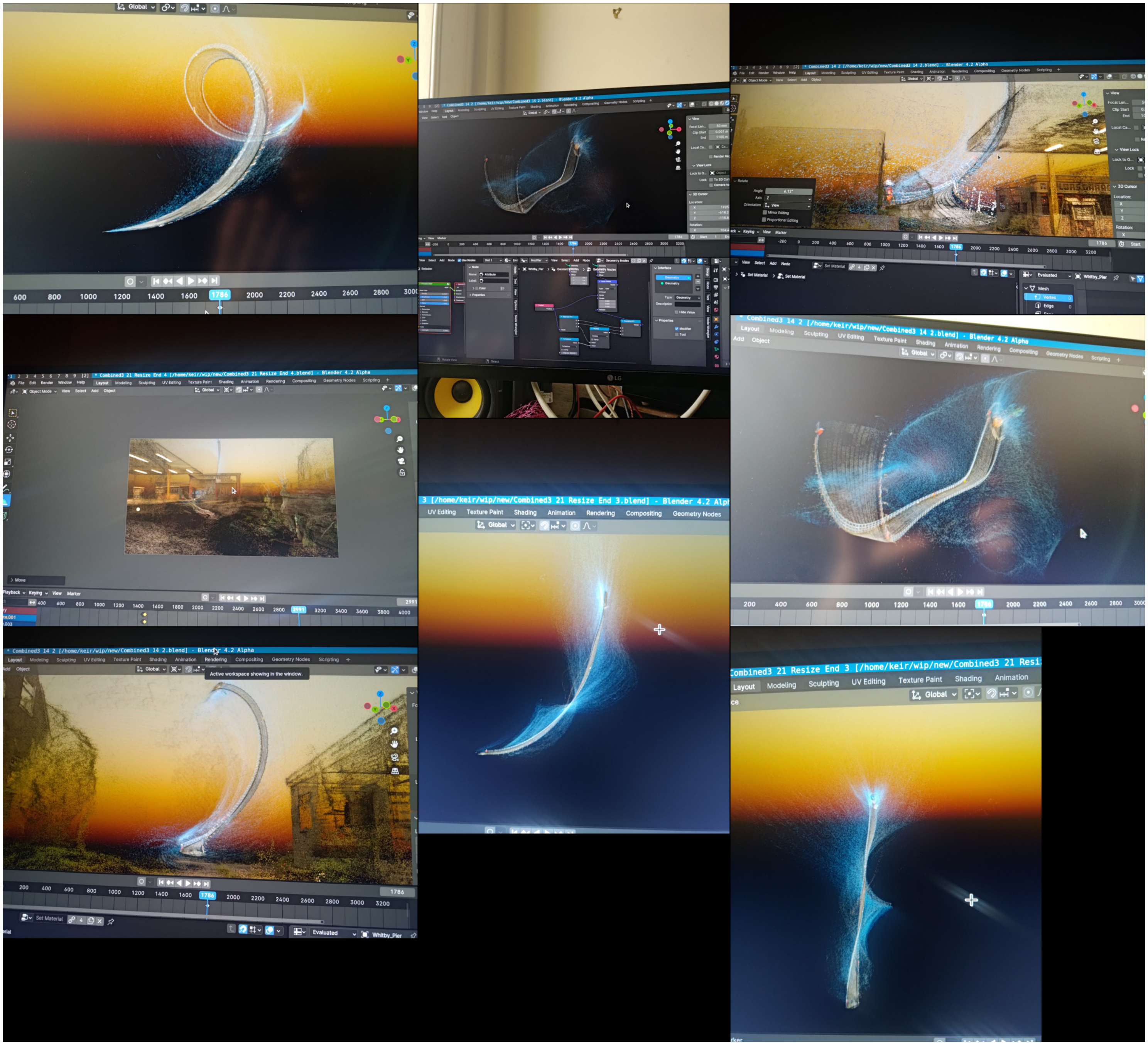

* Combined3 14 2 [/home/keir/wip/new/Combined3 14 2.blend] - Blender 4.2 Alpha
* Combined3 21 Resize End 4 [/home/keir/wip/new/Combined3 21 Resize End 4.blend] - Blender 4.2 Alpha
3 [/home/keir/wip/new/Combined3 21 Resize End 3.blend] - Blender 4.2 Alph
Combined3 21 Resize End 3 [/home/keir/wip/new/Combined3 21 Resi
Layout
Modeling
Sculpting
UV Editing
Texture Paint
Shading
Animation
Rendering
Compositing
Geometry Nodes
Scripting
Global
Active workspace showing in the window.
Set Material
Evaluated
Whitby_Pier
1786

Figure 24: I wanted to gain height with Whitby Pier, but I didn't want to do a unnatural camera movement like I had in the original video. So I needed to bend the point cloud. I tried using lots of tools to achieve this, but these tools often where limited when it came to the need to animate the point cloud from normal to curved. I also needed to accurately bend the point cloud with set start and end points. I tried normal bend modifiers and shape keys, but this lacked the control I needed. Once I found the method of using a lattice object with a shape key as a deformer I found the precision I needed. But it still took a few attempts to find that since I wanted 1 separate twists combined into one, that I should use 2 lattice objects each twisting the object in a particular direction. This was then animated so that the two twists appeared as one.

11 McNeil's Exhibition

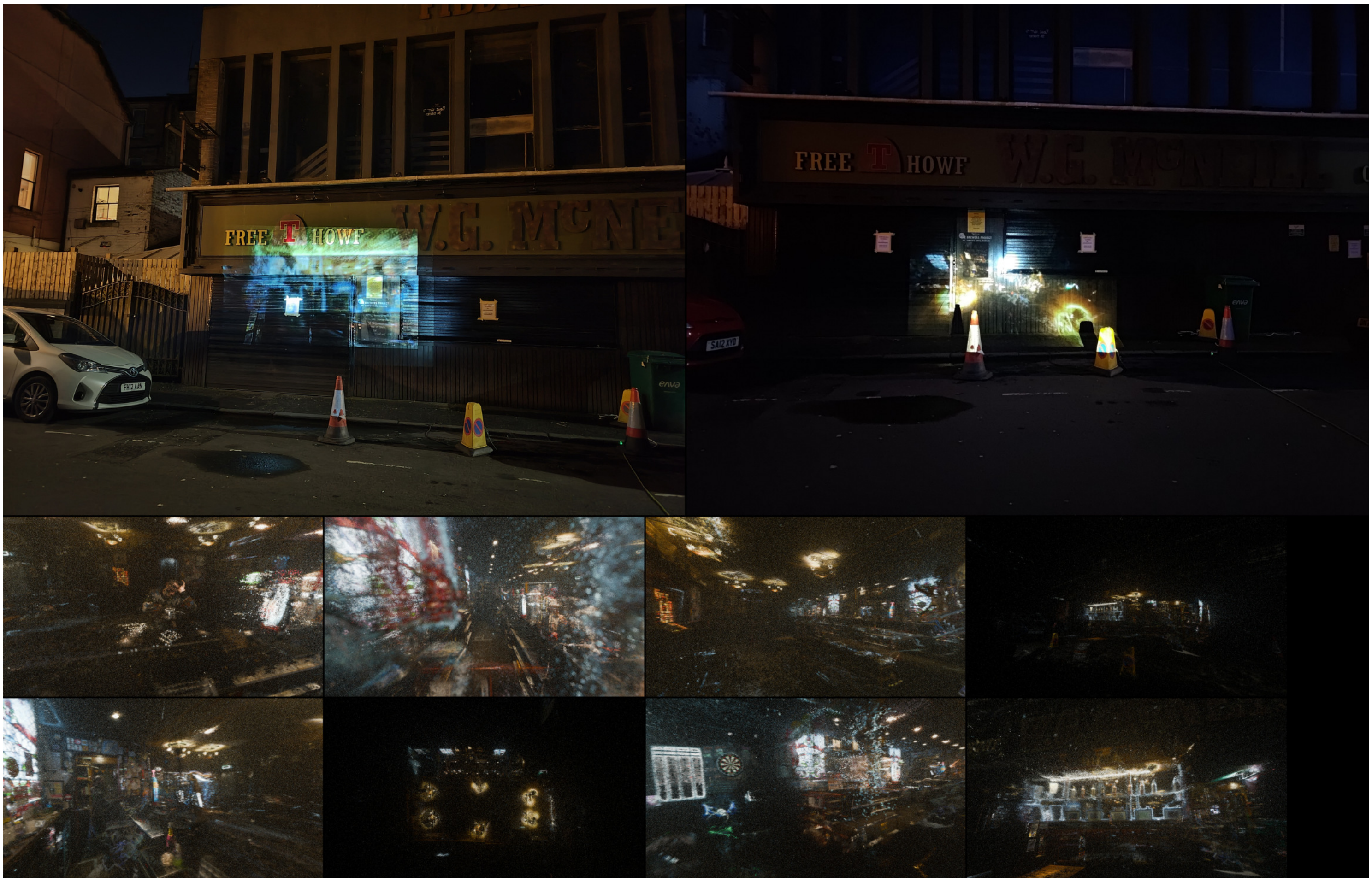


Figure 25: A projection onto the outside of the pub McNeil's located near Queens Park, Glasgow. The pub was temporarily closed and has only reopen upstairs. The down stairs of McNeil's is where the soul and the locals memories are. I wanted to capture this for regulars and passers by, to remember their fond memories. The audio is from a recording of the pub. The Audio was mixed on the speaker I was going to play it on, I used the natural distortion of the speaker at high volumes to add to the feel of the sound. I got the audio from the artist and friend Freddie Bubble who had recorded the audio for a past exhibition. Both elements, the point cloud and the audio, were captured before the pubs closing by coincidence. This taught me that it might not be obvious what I will use a point cloud for, I must capture what feels right and some day it may show its value. I want to continue this into the future as a integral part of my practice in hope these opportunity show themselves more often. This was also quite fast for me to make compared to a larger collage so I can easily fir more in. One very important aspects of point clouds is seeing a place you know well, digitised. This is something I experience in all of my work, but something I am always looking for ways to share it with others. There was something that felt very important of sharing a familiar but inaccessible place.

* A compilation I made of the Exhibition, with multiple perspectives and projections including the original video. The audio is a mix of the audio I played on the night and a recording of the night to hopefully show what it actually sounded like to be there.

12 Monolith

12.1 Soundscapes - Ben Crick & Michaela French Exhibition

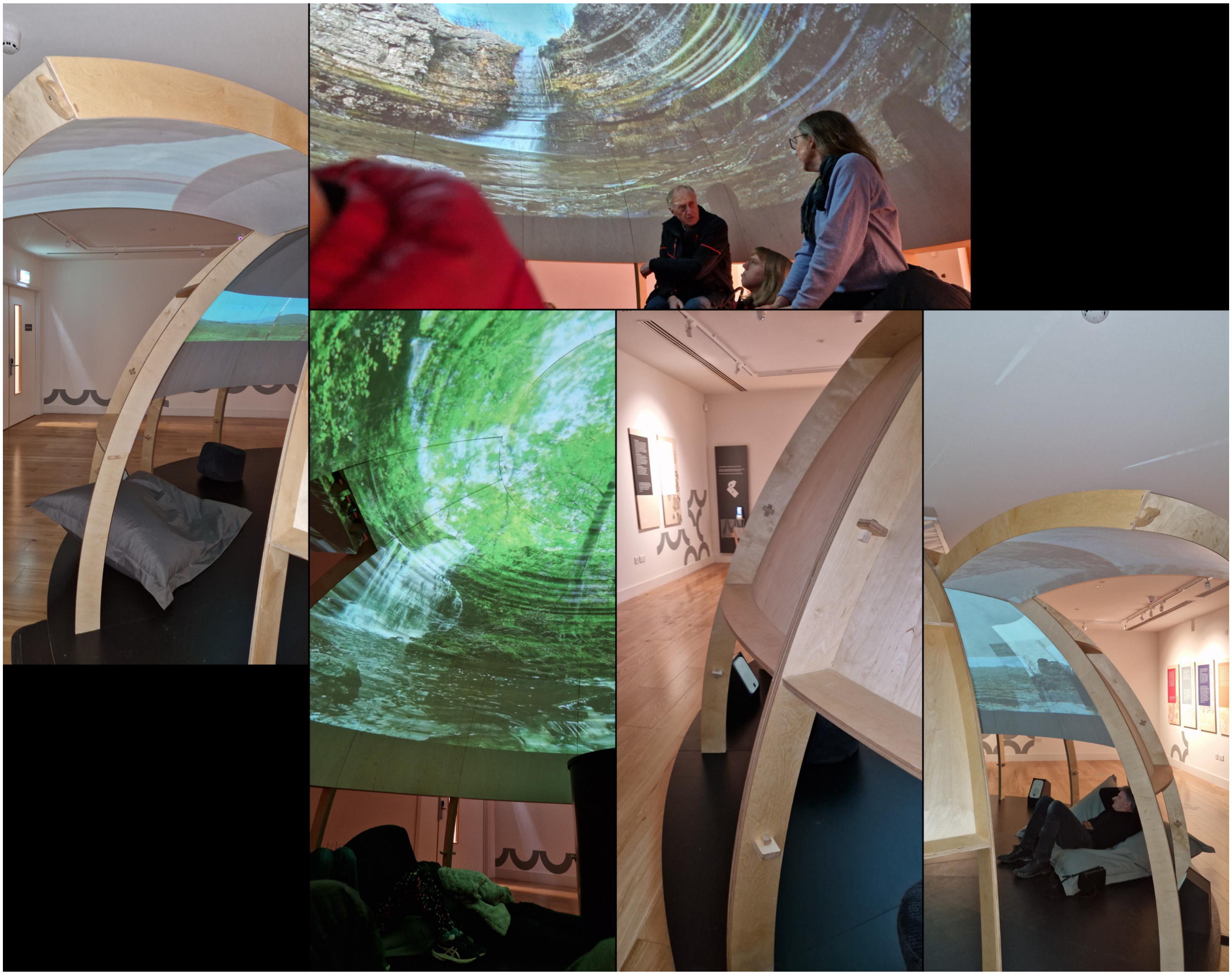


Figure 26: Soundscapes attempted to be an immersive projection experience. It's failures really helped guide my journey. I thought the structure was almost interesting, but it fails at the place where most full dome projections fail. People have to look up, and cannot move around the space without blocking the projection. This in some way defeats the point in the first place of having a full dome projection, if you cannot effectively look around and explore the visuals, why are they there? There is one good reason they are there and that is a psychological level, the knowledge that there is an environment around you is immersive even if you do not look at it, its presence is enough. The main dislike I had for this work was the gallery space it was in and how little it did to separate you from the gallery space, even the plywood structure added to the white cube nature of the space. I do not find the white cube immersive. Also due to the lack of lighting control the contrast of the projection itself was quite lacking. If there was a curtain and a darker paint used I could see a great improvement for this work. I had quite a strong distaste for projectors after this exhibition.

12.2 How to Display Digital Art

Figure 27: There are obviously more references to elevators and monoliths like the Shinning, Toy Story, Drive, Stone Henge, Dark Souls, and Inception but these remain the core to what emotion I was trying to make.

I had to plan and research different methods of showing my work, it was limiting the amount of work I could do on the video, as I needed to know if I needed to make any design decisions for the screen layout. I brain stormed with the equipment I could get access to as well as my dream situation. Here are some notes from that brainstorm:

- A mix of projectors and monitors
- VR
- Multiple 40" TVs from the media suite.
- My dads OLED TV, it has amazing colour reproduction, it is the holy grail of panel technology.
- One Projector
- expanded display, project around the OLED. Projection map out a rectangle black mask on the TV.
- When I was thinking about a space ship or a vehicle, one idea I had was to put a couple of screens on the wall as "windows" they don't have to be symmetrical.

- Vertical screens may look like elevator windows.

Then I came across the idea of using a monolith, here are some ideas I had initially about the monolith.:

- A wall with 2 large TVs back to back, that you can walk around.
- One TV Looks backwards, one TV looks forward.
- It could work with 3 TVs. or 4? - if there is 4 monitors, maybe don't rotate the camera at all.
- 2 would be most simple to plan the video for.
- Can we have lights in the room turned on and off if we are using TVs, programmed by the video.
- Multiple monitors, I own 3 27" 4k identical monitors that could be used.
- Floating Monolith, not attached to the floor, A surreal way Adding weight and presence to the monolith, for the screens to be a glowing tip

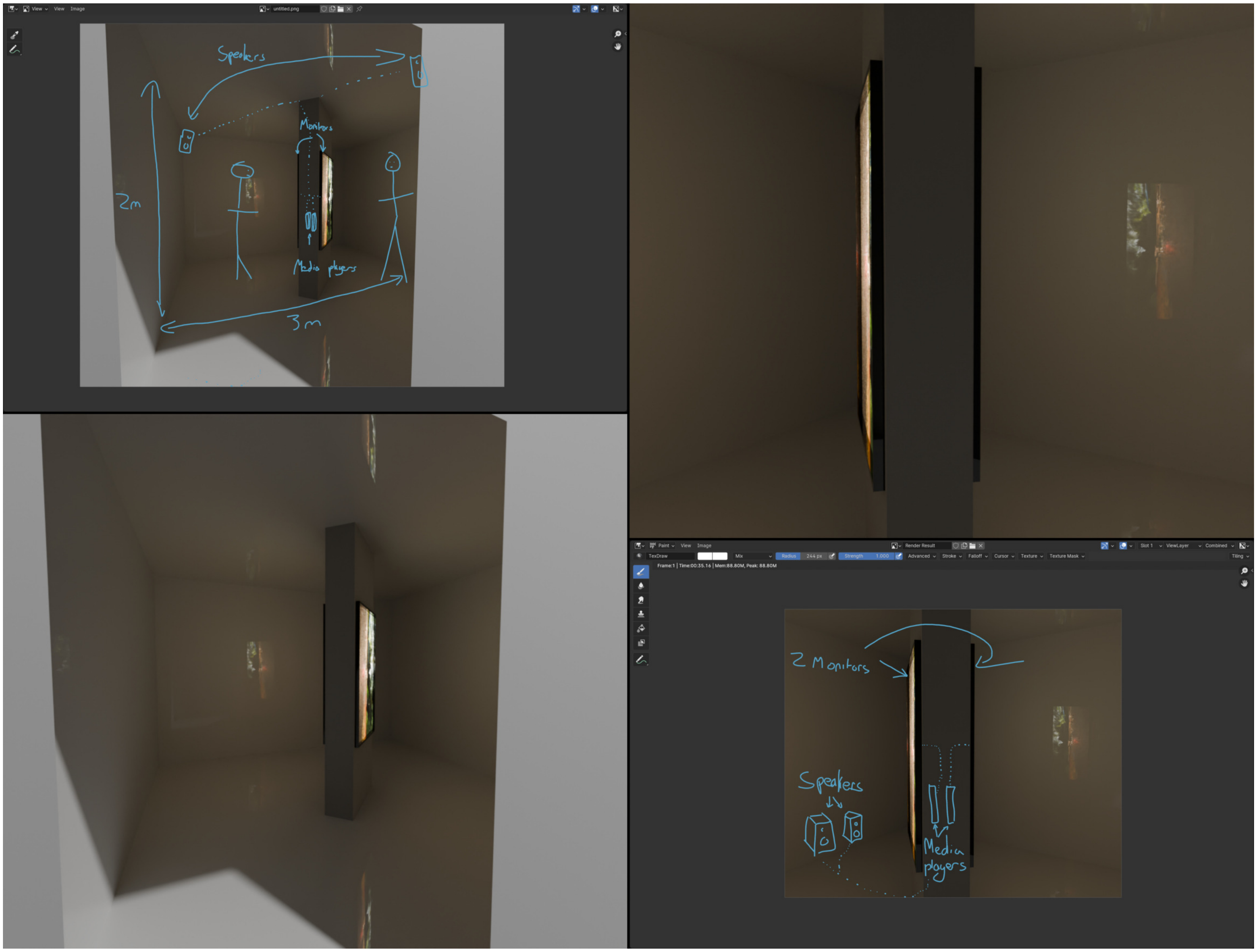


Figure 28: I want the mirrors to be shorter than the monolith and the monitors should be head height. This is all because its a monolith, a Stonehenge to walk around. The speakers may fit inside the monolith or might have to be around the room. In these images I was experimenting with how the monolith would fit in the space and came across the reflective walls. This was an idea I had earlier on, to make a mirror room, so I thought this idea was worth pursuing. I wasn't quite happy how you couldn't see both monitors at the same time, this is made worse by monitors looking washed out when viewed off axis.

12.3 Mirror

I wanted to have some giant mirrors in my space, but when researching how to get the mirrors, they where prohibitively expensive. I remembered seeing A video by NightHawkInLight On YouTube where he made a curved mirror out of a Mylar blanket that could melt rock with the sunlight. This was a great place to start, and with some more research I found people that had already tried this method and had multiple pointers for where to start. I adapted their methods for making large rectangular mirrors, as most people were not going this large. I was initally thinking of vaccum forming the Mylar like NightHawkInLight, but after seeing these videos, they just stretch it like a canvas and then apply heat to shrink the Mylar. I may be able to glue this onto a sheet of plywood if I need them to be mountable and thin. How To Make Parabolic Mirrors From Space Blankets - NightHawkInLight

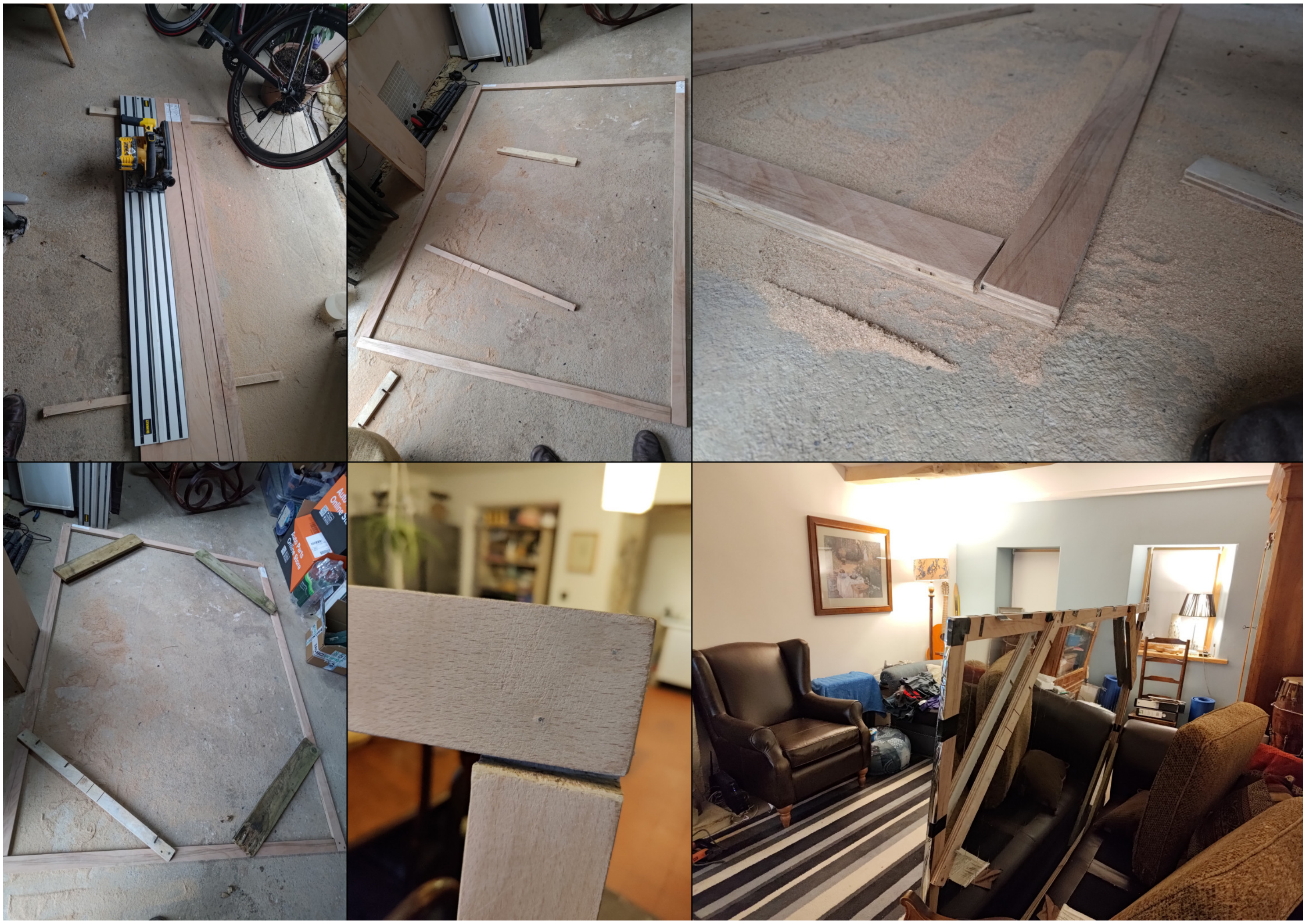


Figure 29: To test out the Mylar mirror idea I built a frame to stretch the Mylar onto. It wasn't quite stiff enough so I added some cross braces but I knew these would have to be removed in the final piece. I used simple lap joints for each corner as I may need to make a lot of them. The Mylar itself was stretched with duck tape as tabs, like a canvas, make a cross and stretch out from the centres. Then with a heat gun the Mylar was able to soften and then on cooling, it would contract and pull taught. I did some tests to determine the dangers and effect of too much heat. First the Mylar would discolour which means you should definitely stop heating. Then it shrivels like a crisp packet, and finally after a significant amount of heat, it can set on fire. But I deemed it quite safe due to the warning signs and amount of heat required for ignition. I also tested how to cut the material if I needed to in the future, I found that scissors didn't work at all, but a knife or even a rotary cutter was much more effective. I also tested what tapes to use, I wanted something that looked similar and found this aluminium tape, isn't as reflective as I had hoped, but it will probably do. I need to know the dimensions of the space the I can fabricate in a flat pack style, and then build in situ.

These are refrences I used while making the mirror to know if things where going well. Shrink mirror tutorial Making a

Hexagonal Mylar Mirror

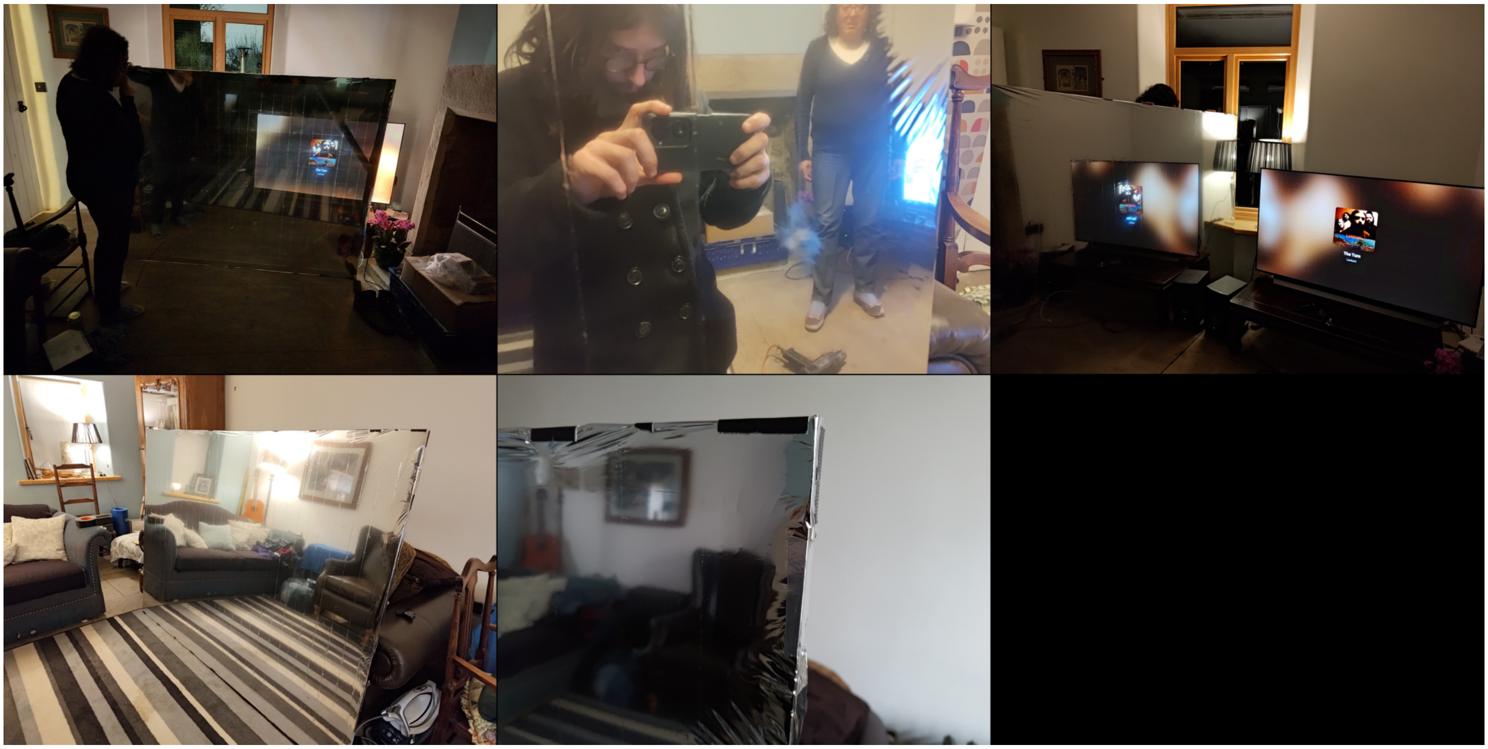


Figure 30: The mirror turned out much better than expected with some slight quirks. It definitely looks like a mirror from a distance, but it is slightly transparent and has wrinkles in it that look very alien, like liquid metal. The mirror also had fold lines that where not removable with stretching, but where quite subtle in places. I also really liked the way that bass heavy sounds would wobble the sheet, I felt like this is something I could use to really make the sounds feel physical. The fabric of space time. A term that kept on popping into my mind while making the Mylar sheets. The idea that the universe is symbolised with material, fabric, often a cloth or other material produced by weaving or knitting fibres, is a background element that I quite like in my work.

13 Bedroom Exhibition

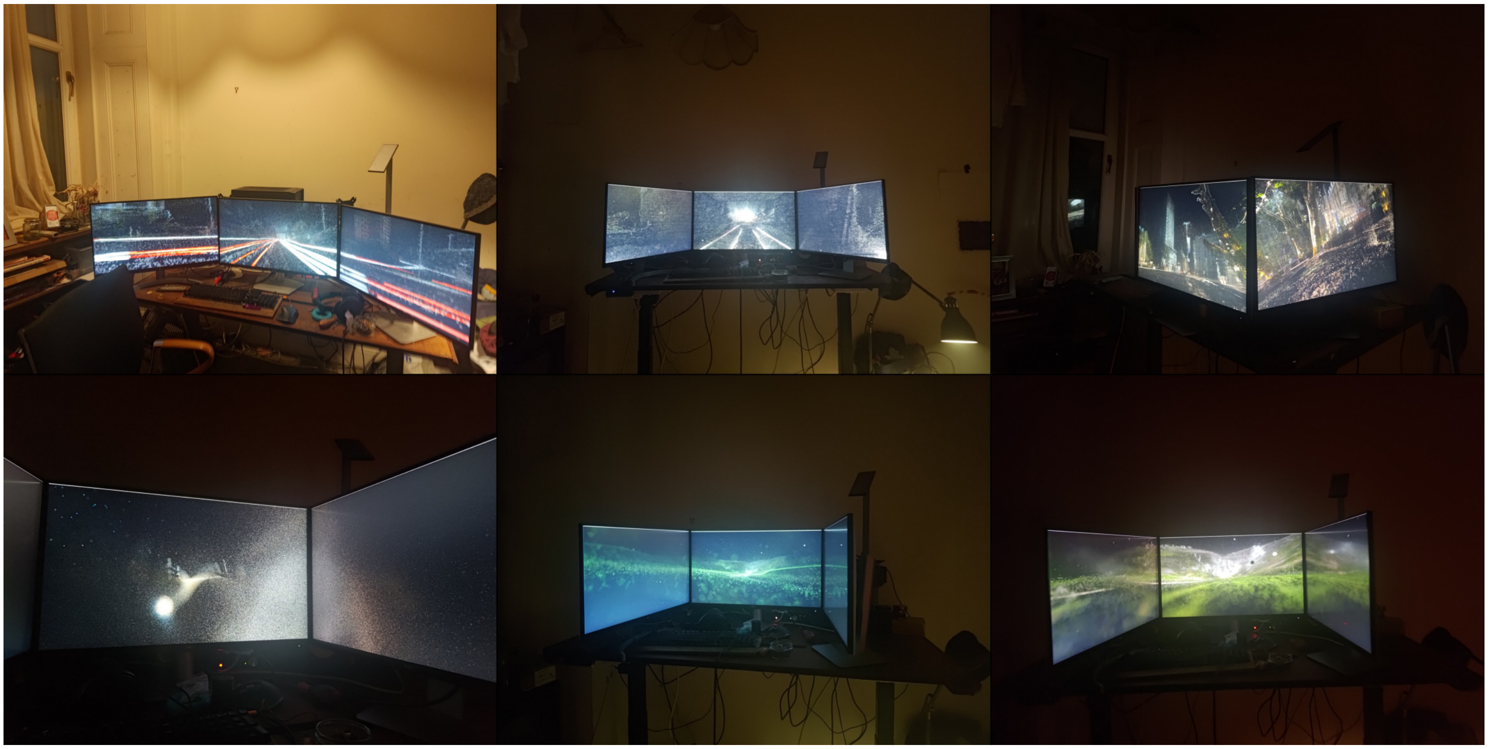


Figure 31: I wanted to test out two final ideas before rendering the video. Using the 3 monitors I had access to at the time what configurations of a seamless video could I experiment with. I settled on a 'inward' and 'outward' looking videos. I could reuse the same video clip for both these experiments as I figured out there is no actual way to render the 'inward' looking direction as it wouldn't be seamless, the edges of each video wouldn't line up, so I did a test render seen in the top left, which uses a single camera that is 3 monitors wide, this gave a stretched image so the side monitors didn't 'look' in the direction they where facing. The rest of these images are from tests with using 3 separate cameras in 3 separate renders one for each respective monitor, this gave the effect I was looking for even though it was quite a bit more expensive to render as the scene had to be calculated 3 times instead of just the once, so this had to be taken into consideration for render times.

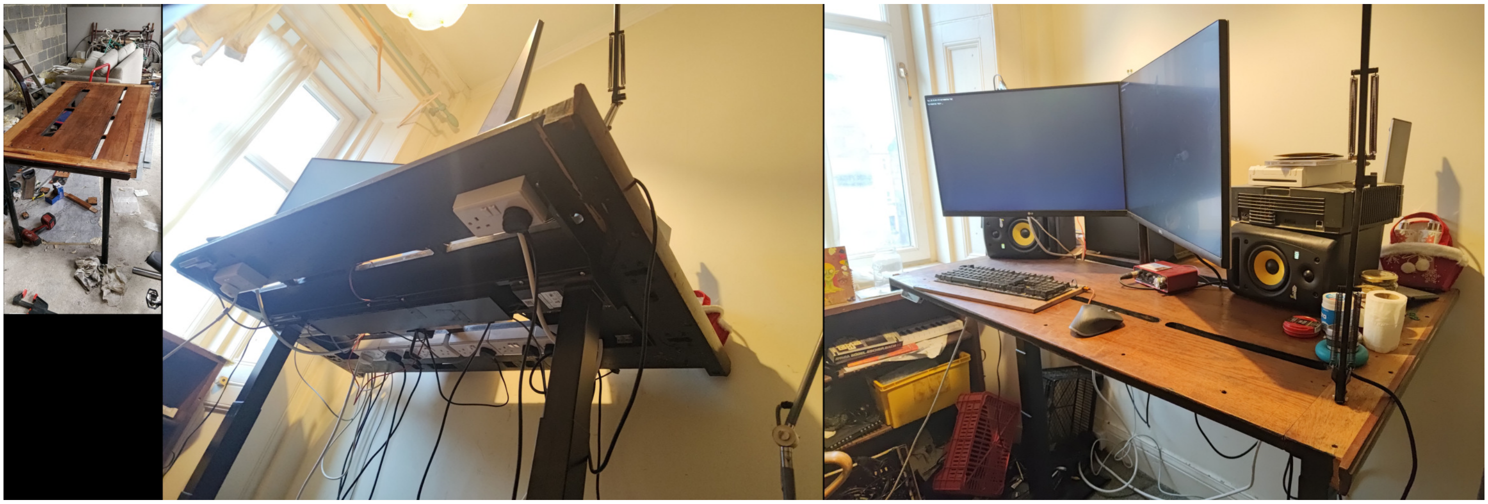


Figure 32: I wanted to test these monitor ideas in a exhibition context, I also wasn't quite sure on the height since it was going to be a bedroom exhibition. Me and my 2 flat mates wanted to set up a relaxed night to display our work in a different context. I used this desk I built this year, that has motorised height adjustment so I can very dynamically test different heights.

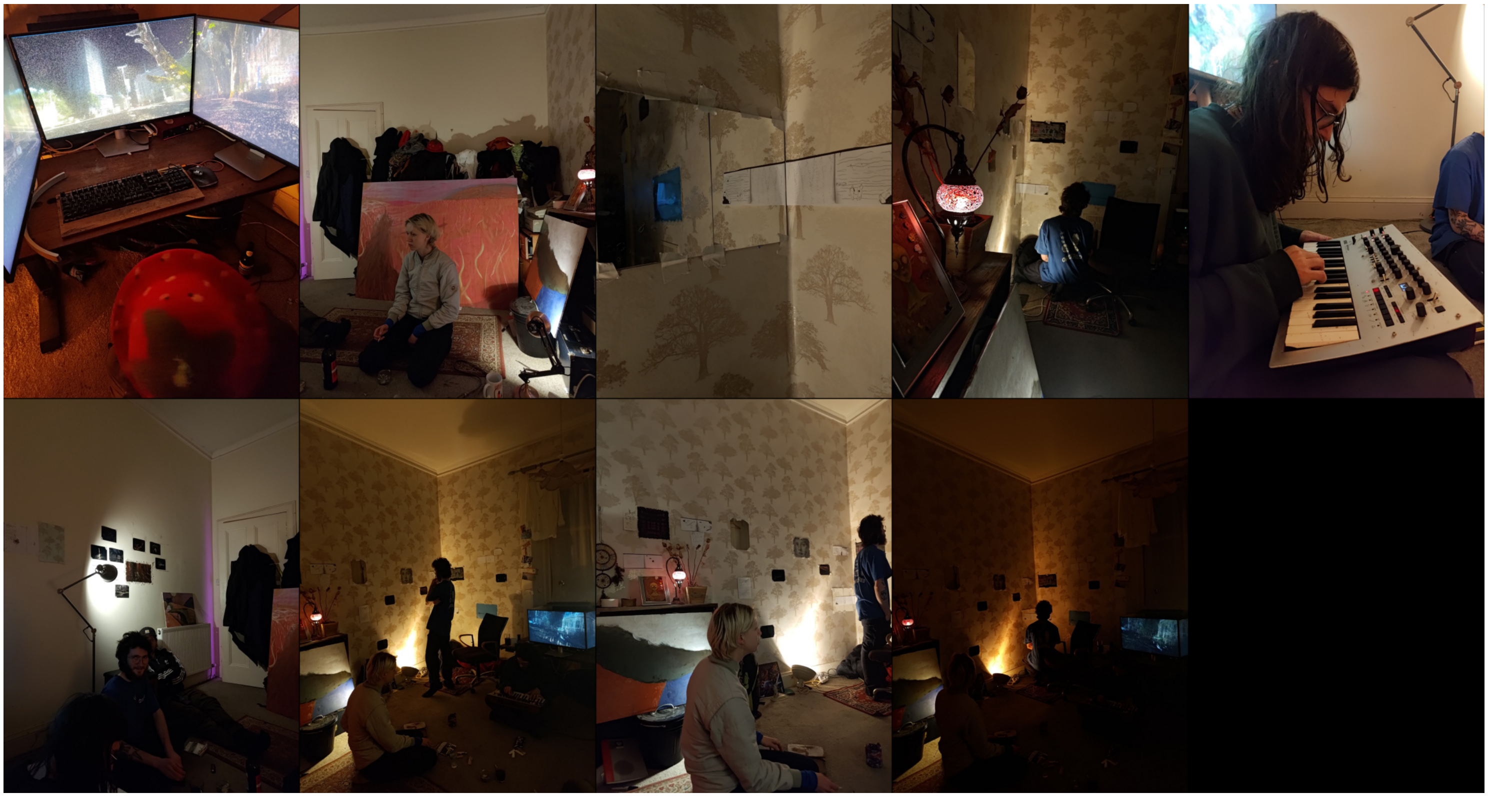


Figure 33: The Bedroom Exhibition consisted of Freddie Bubble, Felicity Hindmarsh and myself. I displayed printed versions of my work around the space, these where printed quite dark so you had to be very close to see them. There where also mirrors placed around the room along side the artwork, as a reflection, of yourself and the artwork around you, expanding the space and opening small pockets into different parts of the room. I also made a synth patch that I was able to leave playing itself, and then later in the evening, I took over and performed for a few hours. Freddie's and Fliss' work consisted of a few paintings scattered around the room and we set up very moody lighting with lamps shining onto the walls to diffuse a warm glow.

14 Thesis

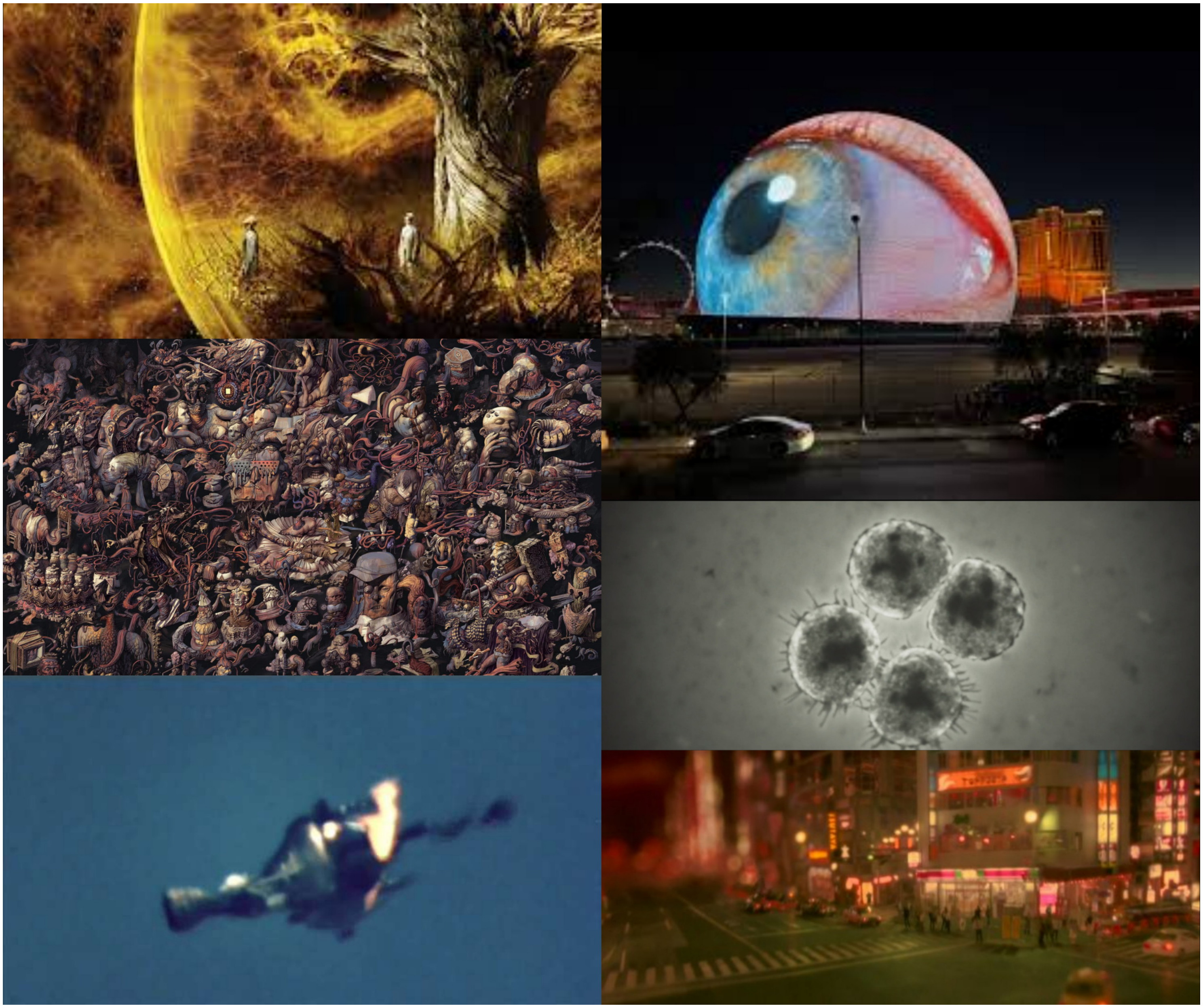


Figure 34: Top Left, The Fountain, A shot of tree flying through space. Middle Left, Disco Elysium, A rich exploration of the different aspects of the human mind through imagery, dialogue and game mechanics. Bottom Left, Koyaanisqatsi, A rocket engine falling back down to earth soon after its launch, the film for me symbolises nature and the destruction of the old in replacement for the new. For me the rocket exploding and watching this fragile engine splutter flames as it twirls back to earth is one of the most horrific realisations I've ever had. The top right is the Las Vegas Sphere, never has a display capable of exploring perspective and space. The exploration of what can be a glowing sphere is very close to my work and has been an inspiration to see how other artists are using this tool. The middle right is Annihilation, this shot heavily inspired having the cell simulation in my work. But is it also the metaphor of the whole film, that another person will change you, and through loss we will find the seed they planted in us, morphs our entire being until it is unrecognisable from our original self. This is the horror of falling in love. This was my personal journey, I used this knowledge to help me understand who I am today and accept that. The bottom right image is from Enter the Void, its use of dream like camera motion and effects really push its visuals into a familiar but alien quality. I study most of Gaspar Noe's films for the camera motion he uses as he uses one shots of a characters perspective in very immersive and emotional ways.

Before my interest in sphere's I was using cubes in all my work, Their three dimentitallity gives them the most simple symetetrical stuctre. But then I started thinking about all shapes and their connection to the context of my work. Then I came across the Sphere. This poem spans a wide range of sizes from the smallest quantum particles to large cosmic structures, all linked by the common theme of their spherical shape or representation. Koyaanisqatsi inspired this motion of building up the decriptions of the natural world.

The Void.
A Sphere? The Soul? Photons? Quarks? Atoms? Molecules? Cells? Dust in the sunlight? Bubbles? Plankton? Rain? Seeds? Ants? Pebbles? Cherry Tomatoes? Eyes? Marbles? Puddles? Ballons? A flock of birds? Boulders? A City of people? An Ocean? Moons? Planets? Stars? Singularities? Black Holes? Solar Systems? Nebulas? Galaxies?
A Universe...

I am also very interested in the concept of the eternal cell, all life is the same organism. One day a bit of chemistry made a cell form out of non-living, inanimate materials, it dupicated and over the millenium till the point we have the human. This interest is mirrored in my other fundamental thesis. Light returns when wood is burnt back into the skies. The energy that is released by burning is the energy that the sun put into the wood. the re-emittance of light by trees, tress have energy. That's why I often make glowing trees, the light they contain is the sun, and there is a beauty to that. And then there is annihilation, how ones self is destroyed and rewritten by another person. The sphere symbolises annihilation. The point cloud symbolises the unnerving and disorganised and innately familiar nature of memories and dreams. We zoom out to see that we are just apes on a rock dukin it out. Looking back towards earth, the context of how shall we are. It will be interesting to explore the idea of continuous or looping video, like the depression of Dark Souls, we will rebirth from the Koyaanisqatsi fall and try again. With The Witness, seeing things from all angles and perspectives. And my newest realisation that my own depression is a pillar of my practice. My own experience of cycling late at night around the city and into the woods depressed, to find greenery and safe places. In the void and depression their can still be beautiful things. The point clouds are the things I appreciated in my darkest moments, Inspirations that helped me process my depression, the silver linings I found, that helped. Behind these things of beauty is the fear, not a direct horror, but slightly unnerving and unsetteling. Familar places but in a different light. I hope people can remeniss about those beautiful moments while surrounded by the horrors of our own mind. Those nocturnal weeks when you can't get out of bed, only to wake in the early hours and step outside to a empty world, devoid of people and life, just the odd car engine or bird in the distance, the air is still. In that darkness, this calling void, we have Ma (The Japanese word for the empty negative space between objects). I particularly like the interpratation seen in The Beginners Guide, the fictional artist Coda, is interested in the space between objects, in particular the empty space between two doors, a void he created that you must cross, you must pass through it, although the Beginners Guide empasises at the end that the space between these doors and the meaning of the entire thing is not set in stone or perscriped meaning by the artist, which is an important aspect of these abstract emotional places, they are somtimes too complex an emotion to have a true narrative for.

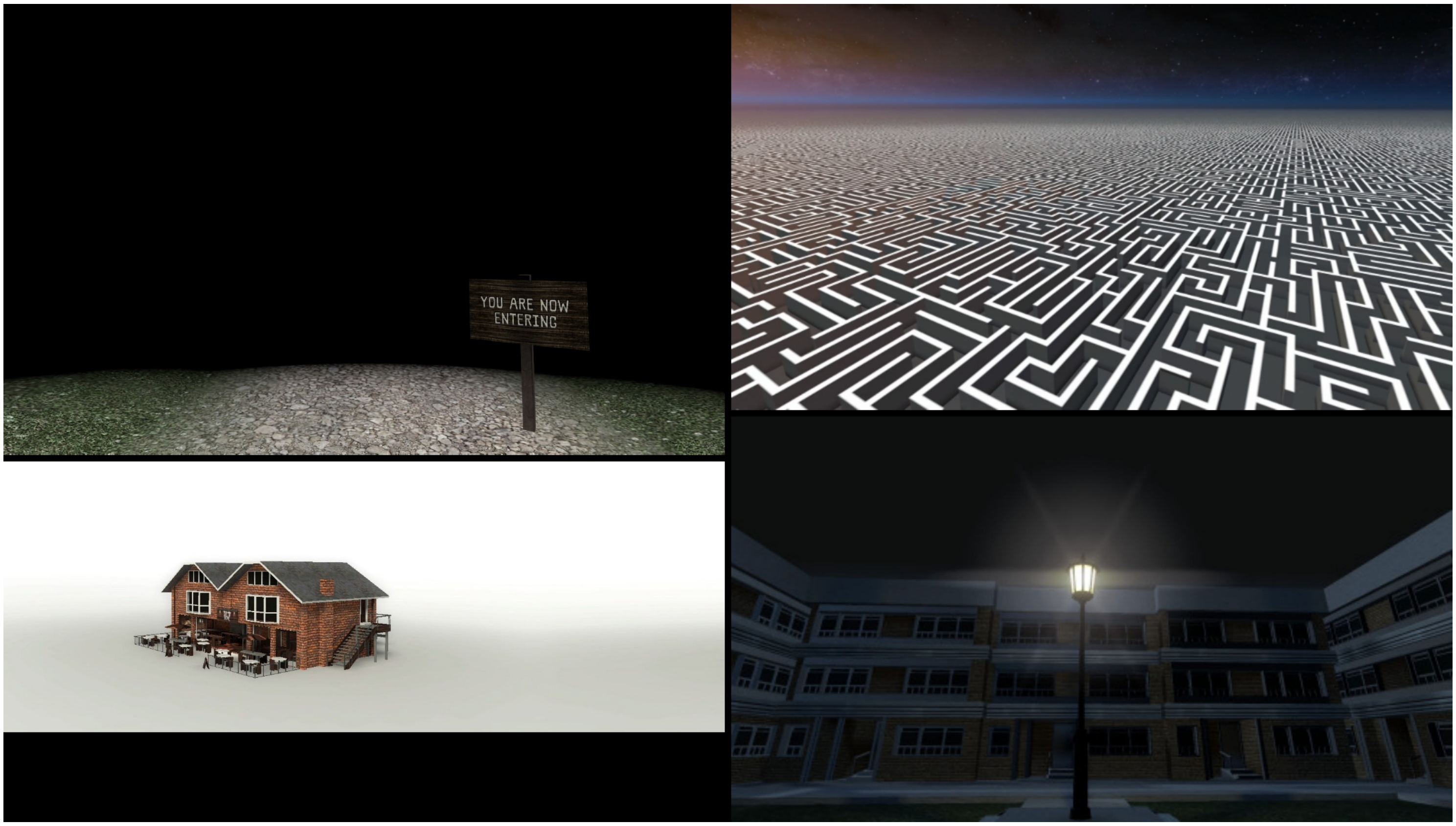


Figure 35: ‘The Beginner’s Guide’ is a narrative-driven video game created by Davey Wreden, the developer behind ‘The Stanley Parable’. The game explores themes of creativity, authorship, and the blurred line between reality and fiction. One of the key themes in the game is the exploration of void or infinite expanses. The game’ s narrator, Davey, takes the player on a journey through a series of game prototypes created by a mysterious game designer named Coda. Many of these prototypes feature vast, empty spaces that the player must navigate. These empty spaces are symbolic of the creative void that Coda feels, as he struggles to come up with new ideas for games. The emptiness represents his feelings of inadequacy and the pressure he feels to create something meaningful and original. Another theme in the game is the exploration of physical spaces that someone has made. As the player progresses through the game’s narrative, they are introduced to various game prototypes that Coda has created. Each of these prototypes is a physical space that the player can explore, and each one tells a different story about Coda’s creative process.Through these physical spaces, the game explores the idea of space as narrative. Each space reflects Coda’s thoughts and emotions, and the player must navigate these spaces to uncover the hidden meanings and messages within them. But the narrator, Davey, colours all these experiences with his relationship with Coda, it is the story of their relationship that the game is actually about. Overall, ‘The Beginner’s Guide’ is a game that invites players to reflect on the creative process, the relationship between authorship and interpretation, and the complex emotions that can accompany artistic expression. The game’s themes of infinite expanses and physical spaces help to underscore these ideas and create a powerful and thought-provoking experience for players. Also the art itself is somewhat ignored by the narrative, there are huge expances and tiny rooms, in a multitude of styles, but more often than not, a traditioal games look is chosen and it is set in the void.

An interactive element of games that I want to transpose to the real world is exploration. The use of looking around and moving to explore a space. This has been explored in Casey Reas’ ‘Textile Room’. This shows a large polygonal structure with fabric stretched across each face, which a projection from the inside. This is an interesting idea, but I want to explore it further. Reas displays similar abstract imagery on the fabric, but if it was more complex, the act of walking around and even inside the structure could be an interesting way of exploring exploration in video games. With the use of 3D rendering and time-based media, I should be able to manipulate perspective in ways that would be difficult or impossible with traditional media. I am interested in creating environments that encourage viewers to move around and explore from different vantage points, with the goal of revealing different aspects of the work as they do so, this is common practice in many video games, especially ‘walking-simulators’ like ‘Gone Home’ and ‘What Remains of Edith Finch’ which are an interactive story as the player controlling a protagonist decoding a story real time. With photogrammetry, projection mapping, and 360-degree video, I think I have all the tools to make this come to life, the biggest limitation ahead of me is fabricating a structure and finding the right materials for projection. There are many artists who have explored these themes in their work, such as Olafur Eliasson and

Anish Kapoor. The use of their environment and moving around their works is crucial to experiencing them, but they do not show any cases of revealing information initially occluded by the sculpture, this is what I want to explore.

The void was a theme I retrospectively realised I was using, I didn't question my use of placing my work in the void till now, it was unquestioned, that's where they belong. The void is lacking in a true environment, a location or a point of reference. Its closest analogy is to floating in space, being in complete blackness. The thing about darkness is that it shapes the things that we can see. It is often a digital environment, the blackness isn't a darkroom, there are no walls to be found, this is a void that extends for eternity. For example, the sculptures of Anish Kapoor, who often uses voids in his work to create a sense of depth and mystery. He uses an incredibly black and unreflective paint to consume areas of a room in complete darkness. This is a space in which there are no boundaries, you do not know if the room continues into the blackness or if it contains a detail, all you see is the lack of information. However, these works do function differently to the digital void we have been discussing due to the surreal nature they take in the real world, in a digital space, shadow cannot be shown without context. The concept of The void can be seen in various forms of media, from film to video games. One example is the 1981 film 'Time Bandits', where the main characters travel through different time periods and dimensions. This location is depicted as a dark, empty space, void of any physical objects or boundaries. The concept of the void can also be explored thematically in media, where it may represent a sense of emptiness or meaninglessness, but in time bandits there is an utter horror to the void. Overall, the void can serve as a powerful symbol or location in media, representing emptiness, boundarylessness, or a sense of otherworldliness. Whether used as a physical location or a thematic concept, it can help to create a sense of unease or uncertainty in the audience.

In video games this theme can be explored in a multitude of ways. In Minecraft there has been a glitch exploited to find underground areas. The player would have the ability to see through the ground until there was a pocket of air, and that space would be visible. This was used to cheat at the game, but the aesthetic of this was my introduction to the void. This one contained glitchy, broken looking imagery from the game, presented in a way you were never meant to see. This gives the feeling of looking through the matrix and seeing the pipes and ducting of the inner machine. As well as showing you a plethora of unexplored cave networks to explore, this displayed the world in a surreal way the caves you are familiar with exploring, are now floating there in the void. This is found in many other games, it is generally called no-clipping, when you clip your head through the edge of the designed play space there is a wide variety of broken textures and geometry, but unifyingly there is almost always set in the void. Also in video games is the concept of going out of bounds, exploring more broken geometry and darkness, out of the designed play space, which for an environment to have a boundary that there is nothing outside of, the call of the void means that people try to find how to escape out of the play space into the void.

The aesthetic of the video game I have also explored. Video games up until the early 2000's was low resolution often with 8/16-bit colours. There was an art found in the impressionistic, limited palette of these early works that live on in video game iconograph. The games prove that realism does not come from fidelity. Realism is often a handshake between the viewer and the environment, if immersed for some time, your thoughts change from the real to the digital. You are inside the screen; the flatness and edges of the screen have dissolved thought into the world that your inside.
8 Bit & '8 Bitish' Graphics-Outside the Box - Games Developers Conference
'Red Dead Redemption 2', is a popular open-world game developed by Rockstar Games. I experimented with this idea with lowering the resolution of the game, this allowed me to maximize the quality of other various visual effects. This means that every pixel is much more accurate to a realistic scene, but there are less of them. Which has the odd side effect of bypassing the uncanny valley and becoming more acceptable as a real space. As video games approach realism, they can often get too close, causing the uncanny effect, or just inaccurate in the smallest of details. They escape being near reality, but at a lower resolution, there is an impressionistic effect of clarity in the blocky appearance.

Here is a good time to discuss the concept of a creative subtractive process to remove information. This has been explored sonically by James Blake in his self- titled album, in which a variety of process were used to isolate elements of sounds to an extreme degree. It is reminiscent of seeing something beautiful while you are suffering with depression. Sounds glow within the abyss of emptiness around them. The setting of the sound seems like a digital cave, as the use of synthesises brings a warm electronic fuzz to the work, sounds range between being incredibly close to being completely swallowed in reverb. Another album I would like to discuss is 'Everywhere at the end of time' by The Caretaker, this is an 'artistic reflections of specific symptoms which can be common with the progression and advancement of the different forms of Alzheimer's.' Alzheimer has lots of thematic connections to my work, being memory and disintegration of that memory. I have thematically explored this idea but not narratively as I would want to do it justice. Everywhere at the end of time is a haunting album that degrades songs over the course of a few hours, Ideas are repeated in less and less clarity. 'The advantage of a bad memory is that one enjoys several times the same good things for the first time.' — Friedrich Nietzsche. This quote is listed on the Caretakers Bandcamp page.

Liminal spaces are often places that are left barren by late-stage capitalism, our current economic climate looks like an empty office building. Looking at Edward Hopper we can see this use of empty spaces, devoid of just enough life that there is something missing. A solitude and emptiness can be made in these environments. This can be also seen in the video game 'Control' which is set inside 'the oldest house' a metaphysical building containing a labyrinth of office spaces and surreal environments. The environments all appear manmade although it seems as if the house itself was the one constructing new rooms. This idea is seen in ‘Portal’ another video game where ‘Test chambers’ are constructed for you as you process through each room, these are constructed out of simple building blocks that seem universal throughout the facility. This is one of the features of liminal spaces, the infinite spanning labyrinth of corridors and interconnected rooms, all in the same drab office décor, devoid of any of the internals of the office. No tables or chairs, or people. The installations of James Turrell, who uses light and space to create immersive environments are a personal favourite of mine. He has a work in the Yorkshire Sculpture Park that I visit regularly to experience. You enter from a field into an old deer shelter, but it soon is apparent that it’s not reflecting the natural environment outside, the brutalist concrete and led lights lead you into the main room. The room seems to be designed for giants as large, reclined concrete blocked tower the parameter of the room. It is illuminated by a perfectly square hole in the ceiling, a seemly impossible cut out of the sky is seen. Clouds and bird pass over head through this small window to the natural world, while you are in solitude inside, away from the elements, so much so there is a square marking on the floor from where the rain falls through the ceiling. The mixture of the brutalist architecture and the raw adoration of the sky is a beautiful experience, but the surreal nature of the hole in the ceiling is something that I am yet to understand its true meaning for me. There exists a modern renaissance of liminal spaces seen on the internet. An urban legend of ‘the backrooms’ starting on 4chan, stories about these images of surreal empty office spaces started popping up. Now Kane Pixel is the most prevalent artist in the space producing realistic CGI video of exploring these spaces. Law and fanfiction evolve this work into something of a fake conspiracy, as decrypting the videos to find information about the backrooms is a common practice. Other internet-based explorations of liminal spaces can be seen in urban exploring channels who film abandoned spaces like the YouTube channel ‘Nexpo’ which explores creepy internet phenomena and urban legends

Here are some title ideas I came up with after these thoughts:

- This Is How I’m Still Around
- Witnessing Annihilation
- Gilding the City
- My Silver Linings
- Witnessing Annihilation in our Reflections
- Vividly Decontextualised
- Ruins / ruin

I have been quite inspired by the artist fred again.. recently, and as you can see by his name, the use of lower case font and text like punctuation is a very personal and intermate way of commuicating your style. So I might go with ‘ruin’

15 RSA

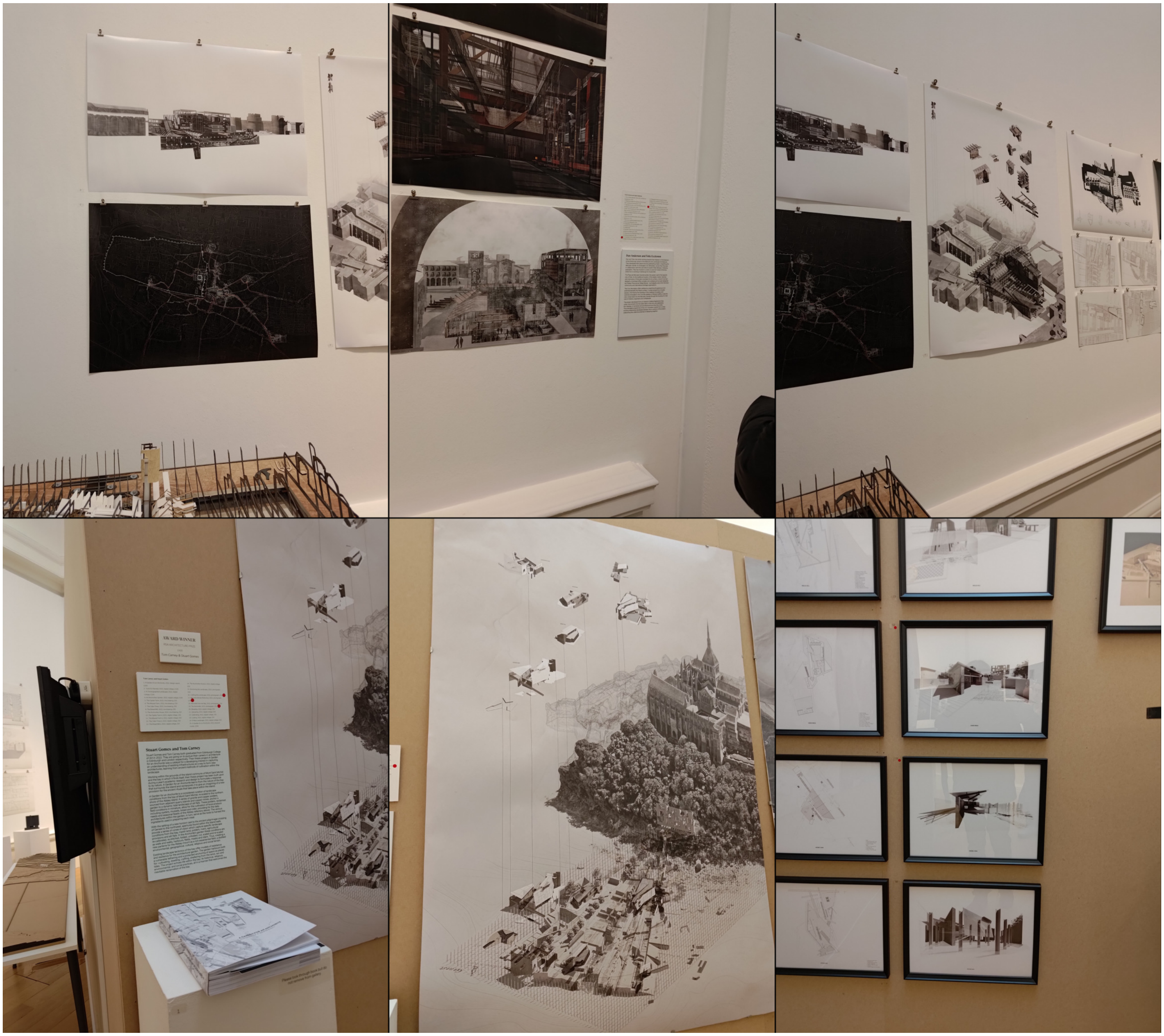


Figure 36: I was surprised by the architecture work displayed at the RSA, the use of quite sterile and brutalist rendering techniques created a very readable but abstract environment. They often seem to use this angle hovering above the buildings at a slight angle, almost an isometric view. The use of negative space really allowed the pieces to float in the nothingness. A lot of images where not dissimilar to out of bounds glitches in video games where only the inside of the room in shown in a infinite void.

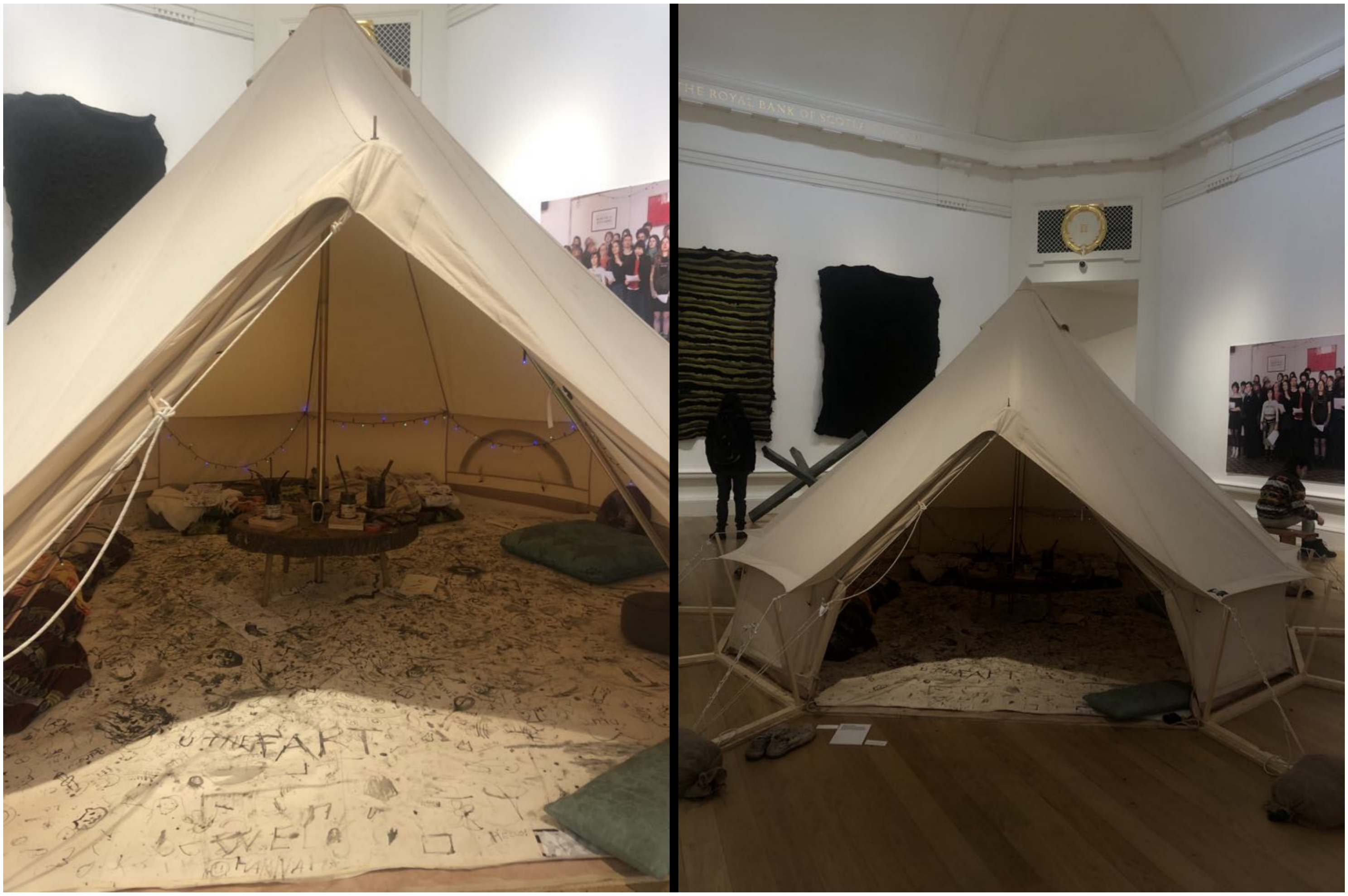


Figure 37: Freddie Bubbles tent was a lovely escape from the gallery space. It was nice to get lost in there using the different inks He had made. But alike to the 360 exhibition by Ben Crick & Michaela French, I was often thinking about what was outside the tent rather than the inside, the partial separation between the rest of the gallery and the inside of the tent never allowed me to fully leave the gallery. If the door was allowed to close, then I think I could have found a very safe space in there.

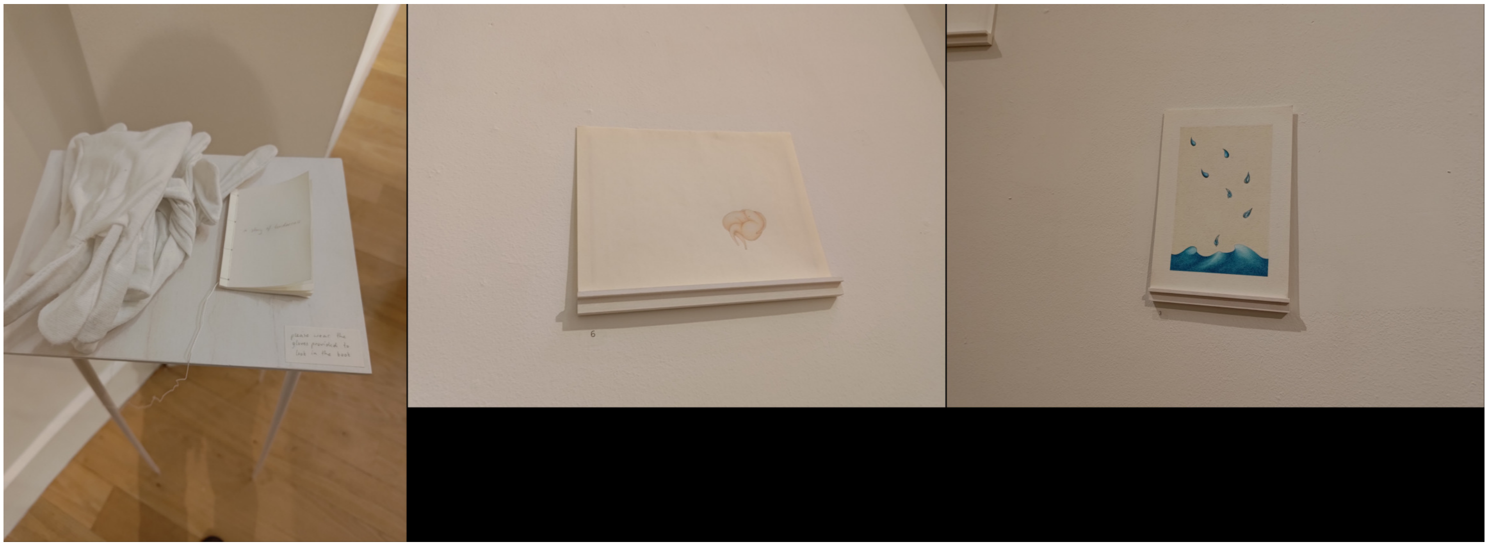

a story of tenderness
please wear the
gloves provided to
look in the book
6

Figure 38: Isla’s work is one of my favourite pieces of art I have seen this year. Her subtle approach and use of negative spaces really captured me. By far the most interesting elements was the image on the left. A small book with instructions to use white gloves to flick through the book. The book itself I felt didn’t quite have the effect of the stand-alone paintings, but the process in putting on the gloves and then gingerly poking at the now fragile feeling pages really transformed the experience.

16 Capture Simulation Point Cloud

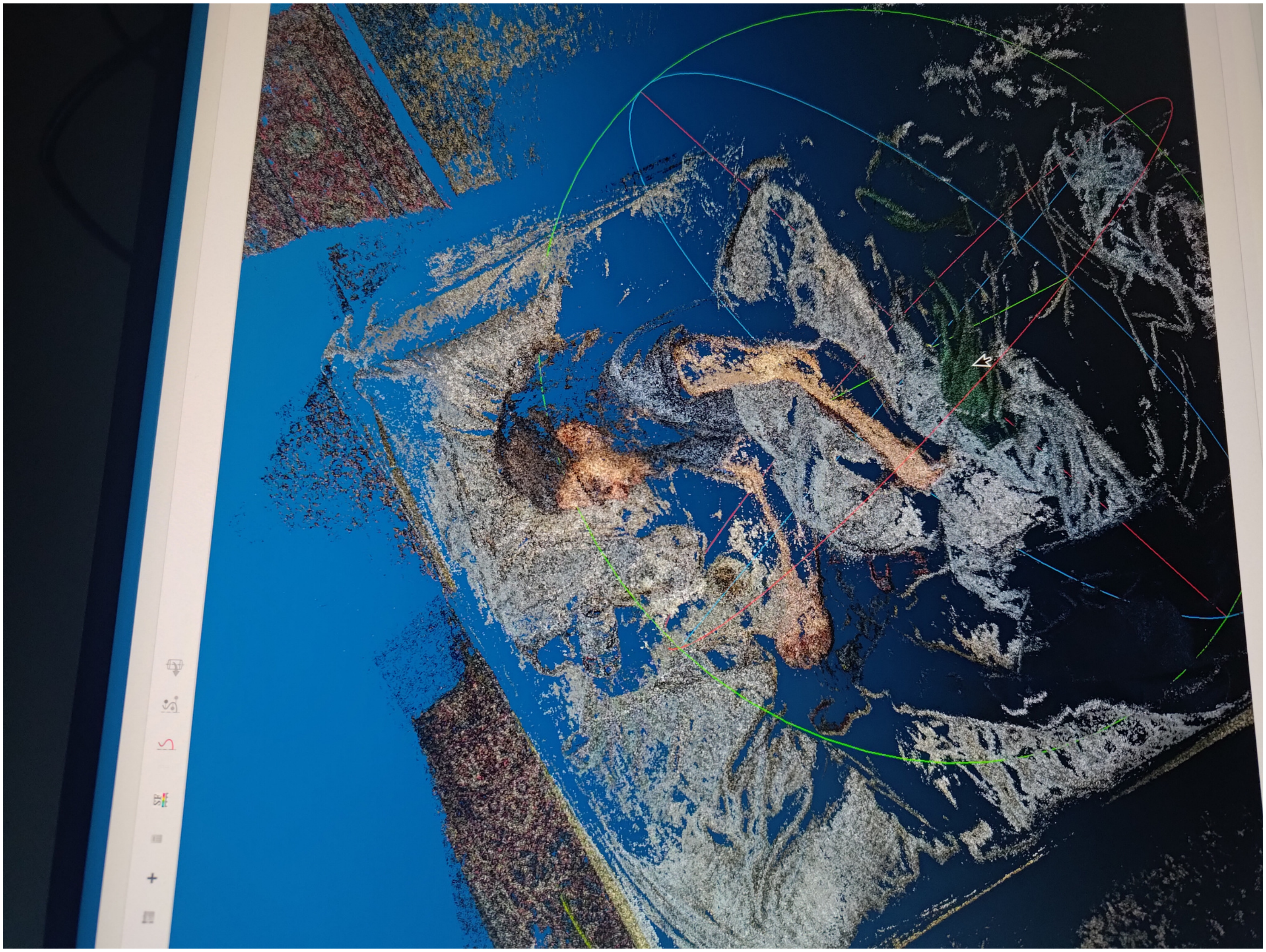


Figure 39: The Cell Simulation is a fundamental of the story but it is natural and does not link directly with the city. The original point cloud, Almscliffe Craig, had no thematic link to the rest of the video. I like how it sets up the overall themes for the video but it doesn't lead in well. After deliberating about where the Cell Simulation is placed in the video and what is the Cell Simulation Point Cloud, I had the idea, that since the video is about my experience of finding beauty in the world in the most dark times, that the point cloud could be me. I chose to capture myself in a bed, the folds of the material will mirror the folds of the fabric I plan to use for the space. The bed is also where my journey started, I rose from the prison of my bed to these environments, it is in my bed that the 'cancer' grew in my mind.

17 Monolith Construction

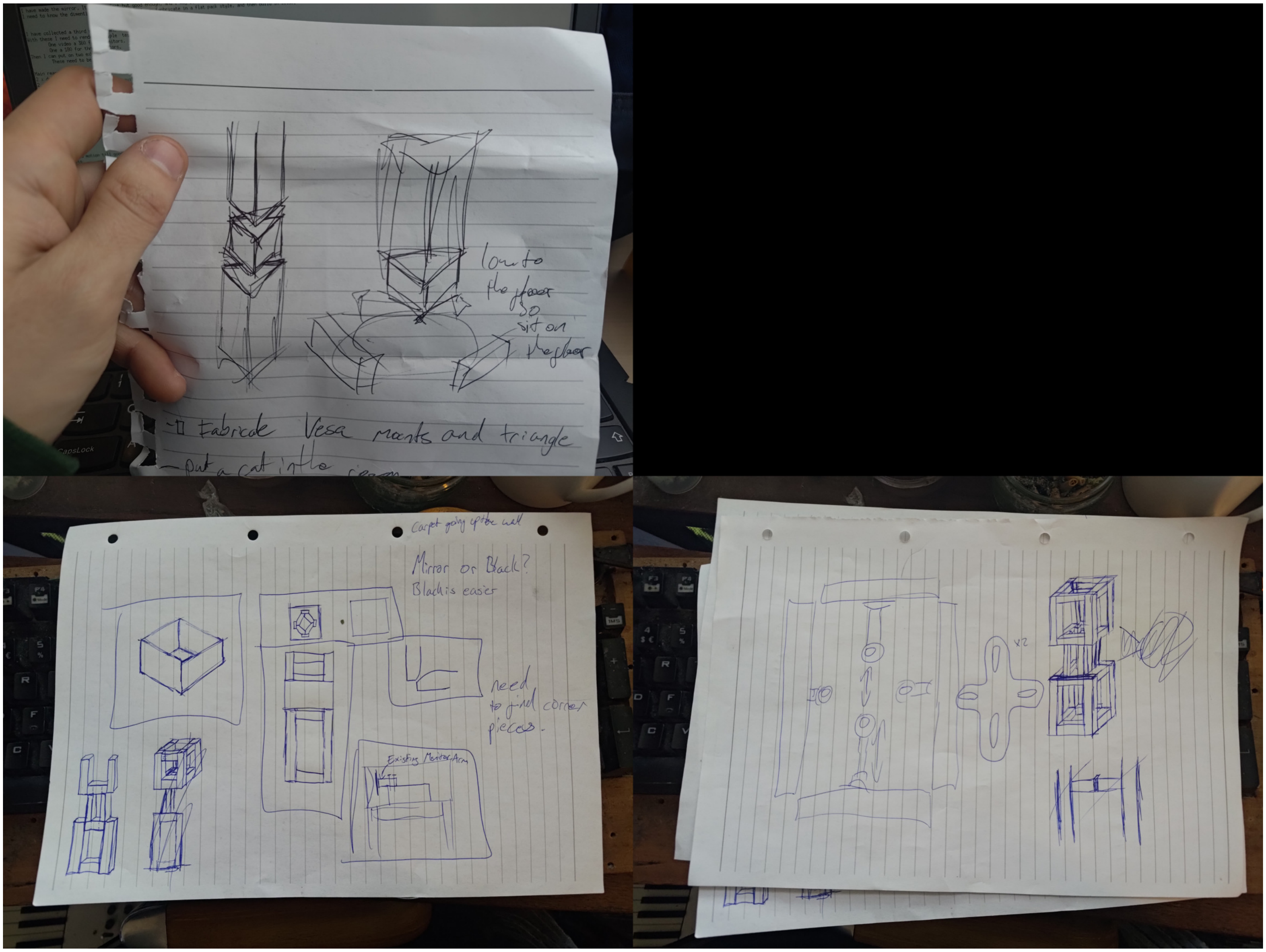

low to the floor so sit on the floor
-☐ Fabricate Vesa mounts and triangle
- put a cat in the
Carpet going up the wall
Mirror or Black?
Black is easier
need to find corner pieces.
Existing Monitor Arm
x2

Figure 40: These are some plans I made of the monolith and how I would construct it, I wanted it to be simple and quick to build as it didn't need to be a perfectly crafted object. In the top left you can see I had ideas about having the monolith hanging a few feet off the ground, I think this would have been an interesting design, however, it seemed more complex than necessary, I was constantly trying to make the minimum viable product that I was happy with and then make that as good as it could be rather than make a super complex design that I won't be able to finish to a high standard.

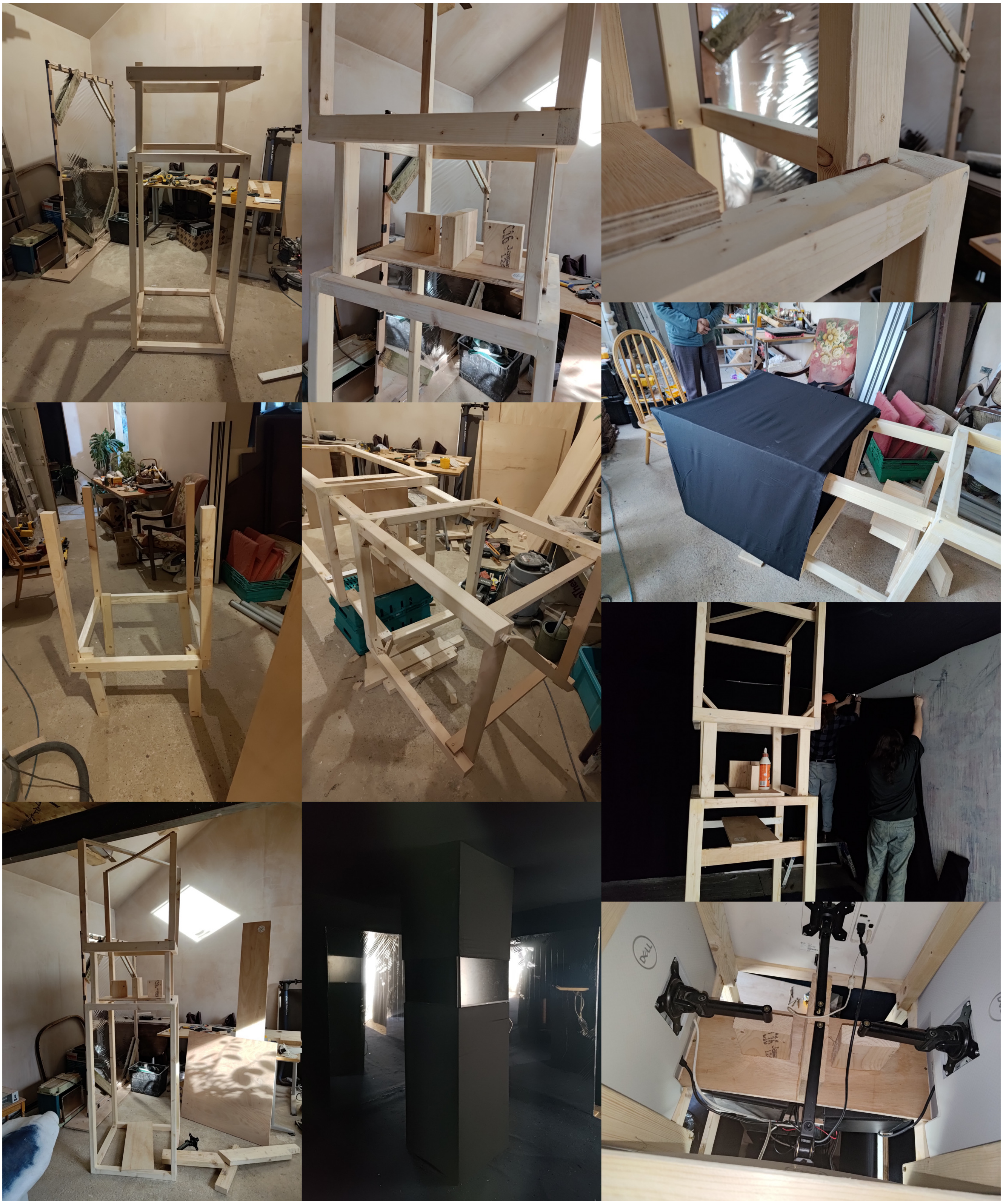


Figure 41: These images show the construction and installation of the monolith.

It was designed off the dimensions of the monitors I had since I wanted them to go to the edge, and there be a band of glowing light around the black monolith. This also had to be transported so I designed joints that would be strong enough without glueing. I had to redesign the top of the monolith as the initial build was going to use plywood instead of material but I changed my mind due to cost restrictions. Also there was a cohesion with the rest of the environment that I liked about using material. Using material meant that the structure now had to support the tension of the material, so I rebuilt it to be stronger after it collapsed under the tension of the sheet. To mount the monitors I used VESA mounts from some monitor stands I had. This allowed me to have fine control after screwing them into position, as I didn't want to risk designing precision components. I also made shelves inside of the monolith so the weight of the equipment would help the monolith feel more solid and secure.

18 Simulations

One of the things from 357 / Cells, that I wanted to rework was the cell simulation. It was very fast and I wanted to incorporate new concepts about the sphere into the simulation to make it more thematic and mean more in the context of the rest of the video. Koyaanisqatsi is not a direct inspiration for this idea, but the general evolution of that film of building up concepts of natural environment turning to human ones, turning into mechanical ones, and then finally turning into digital ones. My video obviously does not have that large of a scope, but it is a condensed version of Koyaanisqatsi. This is more of a direct nod to Annihalation, especially the intro where the eternal cell is discussed. My interest in cell division simulation has led me to explore various other types of particle simulation and simulations that can be relevant to my art. One example of a cellular automaton that caught my attention is the Game of Life, which is a program designed to simulate a simplified aspect of life. The game of life has four rules that dictate the fate of each cell, and it allows us to observe emergent behaviour that can be both fascinating and unexpected. With just a random grid of cells and these simple rules, people have created complex machines that are Turing complete, meaning you can make the Game of Life inside the Game of Life. Another type of simulation that I explored is the BOID model, which is a computer simulation of animal behaviour. It simulates the flocking or swarming behaviour of birds or fish, and it can be used in various fields such as computer graphics, animation, and robotics. The Gravitational or Planetary simulation is also an area of interest, which can be used to simulate the motion of planets, stars, or galaxies. These simulations can be used to study the behaviour of the universe and to understand how celestial bodies interact with each other. Fluid simulation is also an area of interest. It is a computer simulation technique used to create the motion of liquids, gases, and plasmas, and it can be used in various fields such as visual effects, video games, and engineering. Lastly, I have found Cartesian Caramel's procedural art in Blender to be an excellent resource for learning how to implement small building blocks into large node trees. His tutorials have provided me with a comprehensive understanding of how to create complex and beautiful procedural art.

I was interested in cells and microscopic photography. The interest originated as a thematic one, that life on earth is one continuous organism, we are all from the first cell. This is an idea I want to explore, but to do so I have researched things about cells. First, we have the album cover for 'Immunity' by Jon Hopkins, made in collaboration with Linden Gledhill. Whose microphotograph and videography look like it is from another world, but too seamless and infinitely complex to look computer generated. There is a tangible as well as dreamlike emotive quality of his work which fascinates me. I have investigated the history of scientific illustration and microscopy, but prefer the modern fidelity seen in work by the team 'Journey to the Microcosm' who capture extremely detailed and descriptive video of all kinds of microscopic life. Luke Jerram and his 'Glass Microbiology' series has explored these forms in a more structured and less realistic form which I don't particular like, these small things that have been styled by the quality of microscopes and that is actually my interest, the way the optics used allows us to see these almost transparent objects. Exploring this I had to research how computers simulate light as at this small of a scale there are multiple light phenomena occurring. We have thin film interactions, which is where a transparent materials thickness is close to that of the wavelength of light, this adds colouring through interference, but this is very hard to simulate for computers, so there is custom methodology for recreating these effects. Microscopists use a couple of methods to see different properties, on being dark field and another polarisation, luckily dark field can be recreated using the same lighting configuration as used in real life, but polarization is something that cannot be done in 99% of light simulations and rendering engines. So, this effect will have to be faked and implemented artistically rather than realistically, unfortunately this will limit how well this will work as detail can be seen with polarization that is created through intricate processes that will be hard to reproduce.

I have also researched simulations in art, to reproduce natural phenomena. A great example is the music video for Max Coopers song 'Order from Chaos'. The visuals are by Maxime Causeret 'His video shows the raindrops initially, then going into simple cellular forms and then showing the important idea of cooperation between simple cells to form more robust colonies of life. This develops into a visualisation of the idea of endosymbiosis, where simpler smaller organisms can live inside larger cells, each providing a benefit to the other, and eventually forming parts of the same organism as they evolve to be entirely dependent on each other. The video also shows competition between organisms for resources, which spurs on their evolutionary development, as each species tries to keep up with the innovations of the others. He also visualises the emergent ideas of flocking behaviour, where groups of individuals form beautiful dancing-like patterns.' I want to make programmatic, algorithmic art like this, it compliments my work due to using points and a lot of simulations work of points. It allows for more conceptual layers in the video. I have looked at other artists with simulations and algorithms in their work, such as Casey Reas and his 'Process Compendium' series. But the idea of becoming God and reaccreting natural process on a computer is more interesting to me and see the process of it growing. There are also other avenues like 'Conway's game of life' which is a great starting point to understand how to create these kinds of simulations from simple rules.

When rendering test images of the cells for the intro and outro, I found they lacked a level of realism. I have practised making realistic materials in blender for varying different things. But I have never tried reproducing a material that is so transparent and detailed. So, I undertook researching different videos of cells under the microscope to help inform my work. I also have a few images I captured myself. Unfortunately alike lots of digital process' the output of a failed attempt is not a paint on canvas, but a blank screen, so for a lot of the cell tests, I have nothing to show. As often I would have made errors that cased it to not work at all, crash or look the same as last time.The Microcosmos Is A Very Stressful Place

I updated nearly all of the simulation with new Blender features and performance enhancers by researching particle simulations. I implemented a better collision and attraction solver. I implemented fluid-like flow and motion. I added a robust method of generating tendrils that took many iterations and designs. I also discovered many techniques that I wasn't able to implement into blender, due to its design limitations, like a voxel grid for advecting points, which is used for nearly all commercial fluid simulation solvers.

I then tested this with more simulation tests of variety point cloud size and didn't like the look of radial pattern that appeared. Realizing I needed a different sorting formula. I wanted to sort a much larger point cloud and by its density rather than radially as I wanted a more organic form to appear rather than a circular one. In the initial growth the cells should be close together, packed in a organised structure, then it should turn into tendrils and be fluid like. I tried combining different algorithms but due to the size of the point clouds and my limited coding ability I had to use a simple method because of computational time required for complex algorithms. This was achieved with the help of ChatGPT as coding is not my forte, it is a tool that I will use on occasion for pointers in the right direction as I have not found it capable of writing the whole script for me. The final sort took 200 Hours. But a new 'Sort Elements' Node has been added to Blenders Geometry Nodes, this allows me to arbitrarily sort a point cloud. I have tested a new version of the density sort that functions in 10 seconds rather than my script that took 100 hours. I can also adjust the sort to be closer to what I desire due to the speed of this update. But making the initial sorting algorithm myself it has taught me more about the process so I was able to implement the new version very quickly.

The last major change to the simulation was simplification. After all of these iterations I have learnt that adding complexity can look good, but it can get overly complex with too many things effecting one another, to the point where it is worth finding the most important forces and just using them.

I adapted my knowledge of the cell simulation to make a gravity simulation. I wanted the whole scene to be sucked into a blackhole and be returned to the singlar cell again to loop. But this was a very difficult challenge to face, since the entire scene was made up of around 20 point clouds up to 40 million points each. I knew I wouldn't be able to simulate all those points so I had to figure out how I was going to simplify the simulation without a sudden change in the number of points. Here are some of my ideas:

- Don't simulate the Sand Stream, the point cloud we are looking at when the simulation being
- Dim the lights
- Out of focus
- Motion Blur
- A flash of an explosion
- Have the sand stream in its own seperate more detailed simulation
- You cannot use any fading out tricks due to having a 360 degree field of view, things never really go 'off screen'
- Make most points into stars that fade out, leaving us with the right amount o of points

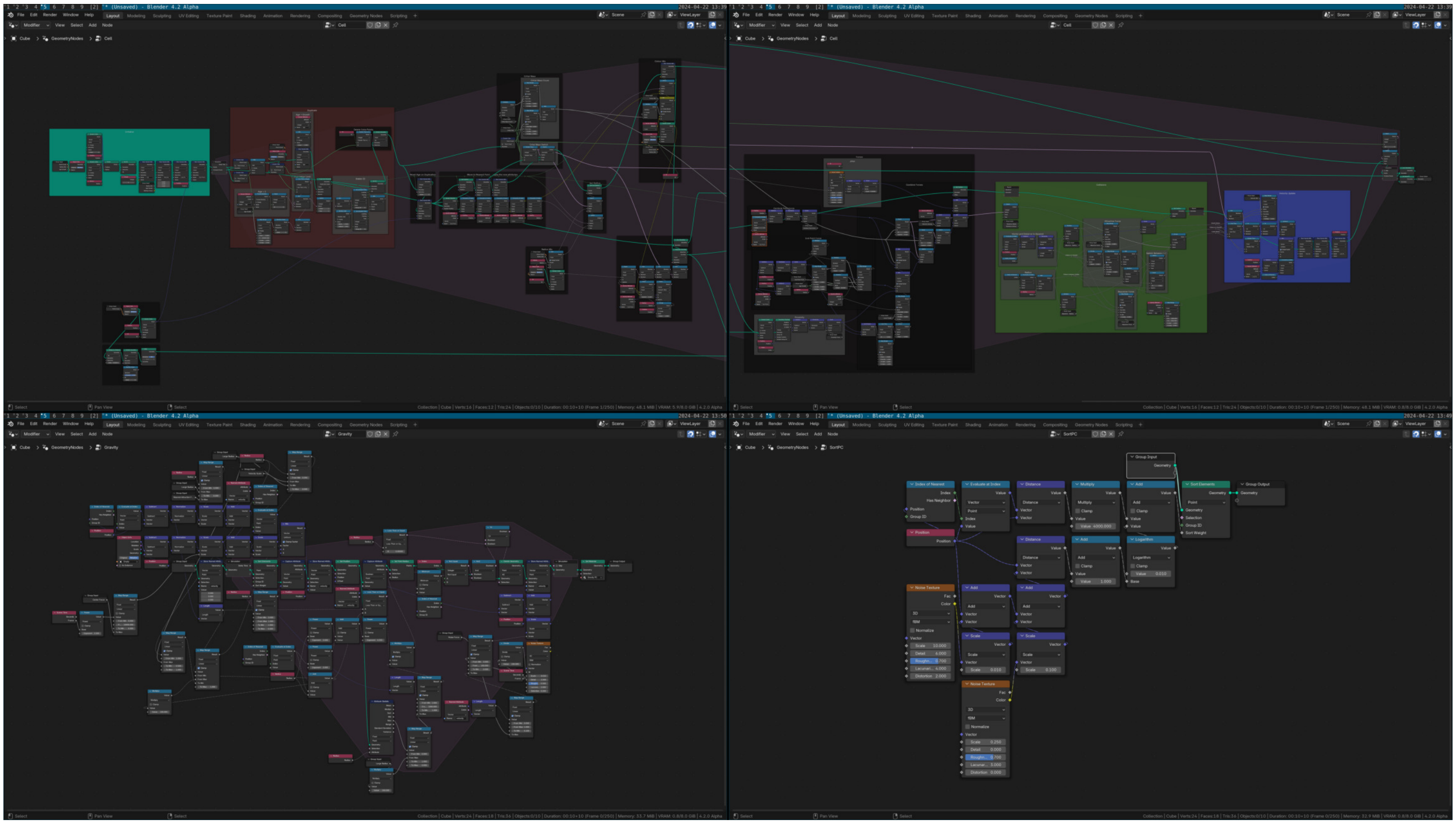


Figure 42: These are the most advanced and complex things I have made this year. The top two images contain the cell simulation nodes. The right image contains a sorting algorithm for the cell simulation input point cloud. The left image is the gravity simulation. I spent the large majority of time this year working on the cell division simulation, it takes lots of research and testing to make complex simulations. And since I cannot replicate reality, I have to make short cuts that imitate reality and finding the exact parameters to create something visually interesting and physically based. The intricacies of each of these node graphs are too complex to describe in any detail, but most of the complex operators are vector maths. A vector being a direction in 3D space with a magnitude, represented in x,y and z components. The main forces I apply to each point are vectors pointing towards; the points final position, the nearest point in the goal point cloud and a noise force. The nearest point calculation is very expensive, it gives a very good look, but means I cannot grow to the sizes I wanted to, so one of the main developments was a discovery tat I could simplify the goal point cloud and still get a similar output. There is a separate loop for separating points that are too close and also keeping the points close together. The main other force that really sells the movement is a velocity calculation that applies a scaled version of the forces applied last frame. This velocity force is mixed with any close points, this also really helps give a viscosity or gravity to the points. There is a overall age counter that makes points duplicate when their age reaches a certain value. This area is quite challenging and custom to every point cloud as I need to limit the growth to not get out of control and make the simulation crash, we need the points to be gently produced, not in giant clumps. I also found a performance improvement that I implemented all across the node graph and that was converting floating point numbers to integers when I could and using floats when I was using vectors unnecessarily. The sorting algorithm was needed to instruct the simulation which points should be grown first, I did this since after testing, If you let the points randomly get to their goal, their is no real pattern to the growth, its mostly noise. One of the biggest issues was finding bugs in my implementation, you have to have quite a maticulous eye for the maths and logic involed. One issue I caused was only taking into consideration the active cells rather than the inactive plus the active cells to calcuate how far through the simulation we where, resulting in uncontrolled growth, but there was no way to know that just by looking at the uncontrolled growth, I had to study all the maths involed in that section. The gravity simulation was reality simple to figure out after I had learnt so much making the cell simulation. Its only really different aspect is the replacement of the duplication system with a merging system, that takes into consideration the radius of the two points that are merging and using a simplified formula (I calculated by hand which took me a while to relearn that area of maths) to find what their new radius should be. Which is: $R_3 = \sqrt[3]{{R_1}^3 + {R_2}^3}$

Best Cell Simulation, still struggling to get it to the desired 10 million points.

19 Performance, Rendering and Planning

Quite early on I figured that I needed to allocate a large amount of time to the rendering of the video, with some quick calculations, I would need round 30 days to render 4 videos at 4k for 14000 frames. Leaving me with around 3 minutes per frame. I took many technical steps to increase render performance, I will split these into graphical and non-graphical tasks.

Starting with non-graphical tasks, these effect the process of creating, lag is my biggest problem when it comes to creating large scenes, Blender slows down significant when working with large scenes and responsiveness is very important to getting real time feedback about what something looks like. The first thing I did was to bake all the point clouds so i don't have to compute them at every startup, I limited them to 40 million but left backups if i need to change that, as working with Jack I learnt that its always best to keep data that seems redundant as its always faster to keep things just in case. I had built lots of seperate point cloud files and when they where all imported into the same file I noticed that Blender was saving every point cloud on every save, which could take more than 10 minuites. This couldn't last since I was spending more time waiting than working. I researched different systems in Blender that could help with this and came across Libary Linking which allows you to import files directly from another already saved file containing the point cloud. This took my save times down to less than a second. It took me a while to understand fully how to used Linked Libaries, but I eventually found that I could make all data local apart from the point cloud mesh data, which allowed me to have no issues with trying to overwrite linked settings. There where still issues like not being able to apply modifiers to linked objects, but I found work arounds like making a new master file everytime you need to apply a modifier. I made tools for working with so many large files one of them being a baking wrapper for my AutoRadius tool, basically allowing me to store information in a non-destructive manner, I used this to have two levels of detail that I could quickly switch between for rendering or animating respectivley. I also found bugs in the Frustum Culllling tools angular size calcuator, it wasn't working correctly and the render was crashing, now there is a max clipping distance and a minimum distance to which we use the angular diameter to delete. I also found that deleting by angular size is a bad idea with point clouds due to them being at different scales and them blocking light. You need the small points for the point cloud to keep its overall form. So I had to modify the calcuation to take this into consideration. I also experimented with settings in the computers BIOS, seeing if slightly overclocking certain components would result in higher performance or stability. I found that there was a conflict between XMP and SMP and if both were enabled, you would crash the computer, but, with just XMP on, I could see very marginal performance improvements, which will add up over time.

Graphical tasks cause more crashes and is often a more difficult problem to solve with less workarounds other than simplification. To detect these problems I learnt how to use a monitoring tool to output the graphics card sensor data during a render so I could look for the moment it crashed and why. I implemented this because I wasn't 100% sure what an issue I was having was. This is the command: `nvidia-smi –query-gpu=timestamp,name,temperature.gpu,utilization.gpu,memory.used –format=csv -l 20 -f /renderlog` Point cloud themselves are realativley simple for the computer to render, but its the lighting and volumetics that I add which take a lot of computational power to render. So it was experimenting with the settings of the fog were I saw the most improvements. I went back and forth on using a world volume or a volume per poin cloud throughout the course of making the video since they both had their benefits and tradeoffs, unforutanly I had to opt for the world volume as I had render issues with seeing the edges of the per point cloud volume objects, the world volume was quite a bit more expensive. I also found that some render settings worked well for preproduction, like turning off the light tree, for fast renders it slowed down the render, but if you were going for a longer render, it would actually improve the speed. I had to do research into volumetic rendering to understand settings like homogeneous or equiangular sampling, to find what what more performant for different scenarios. At the end of the process I had to remove a lot of the detail and feeling from the fog which I will try to get back in post production, but it will not look as good. But sacrifices need to be made since things like the length of the video, are quite important and most people aren't as picky as the visual fidelity as me.

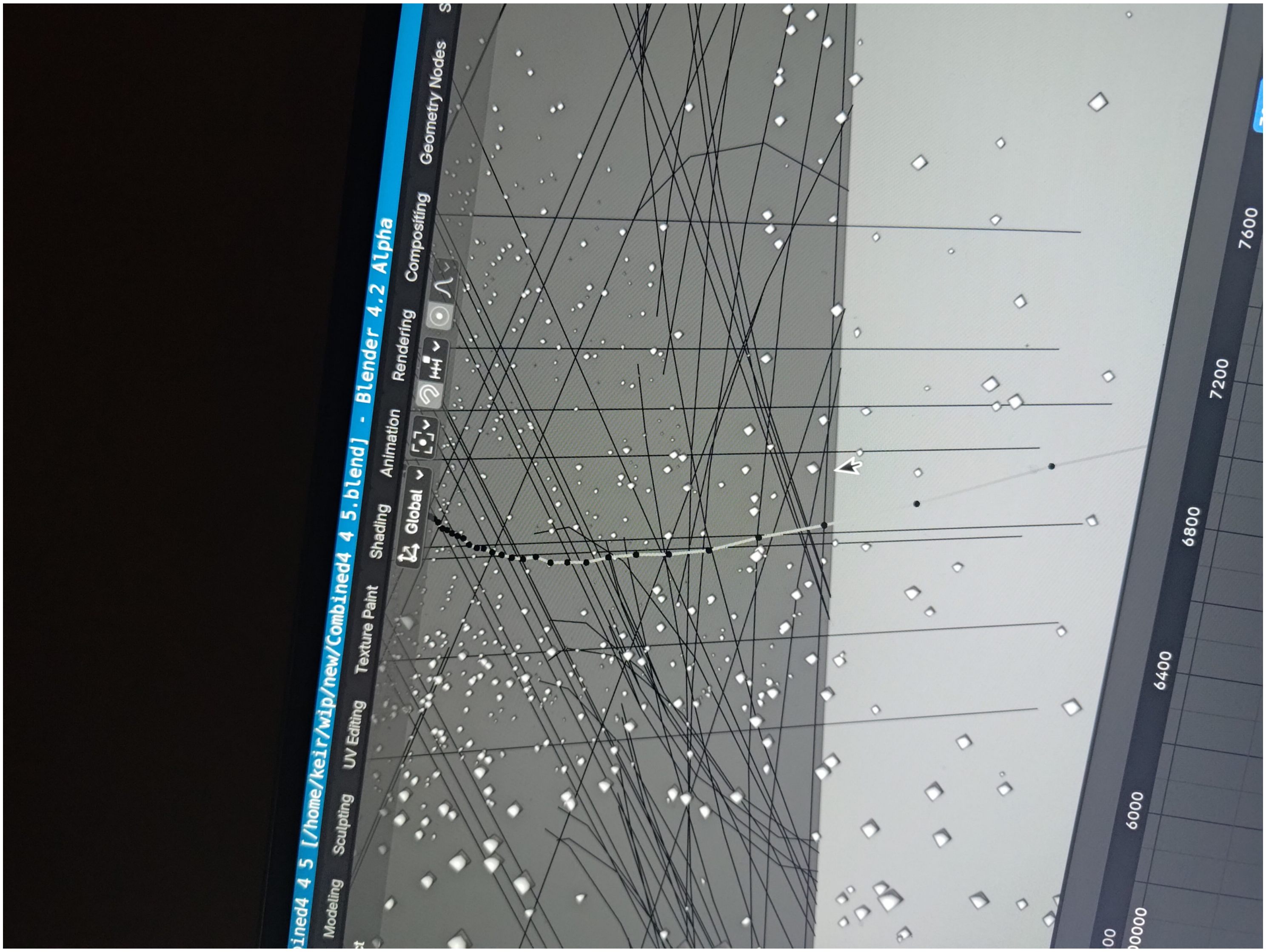
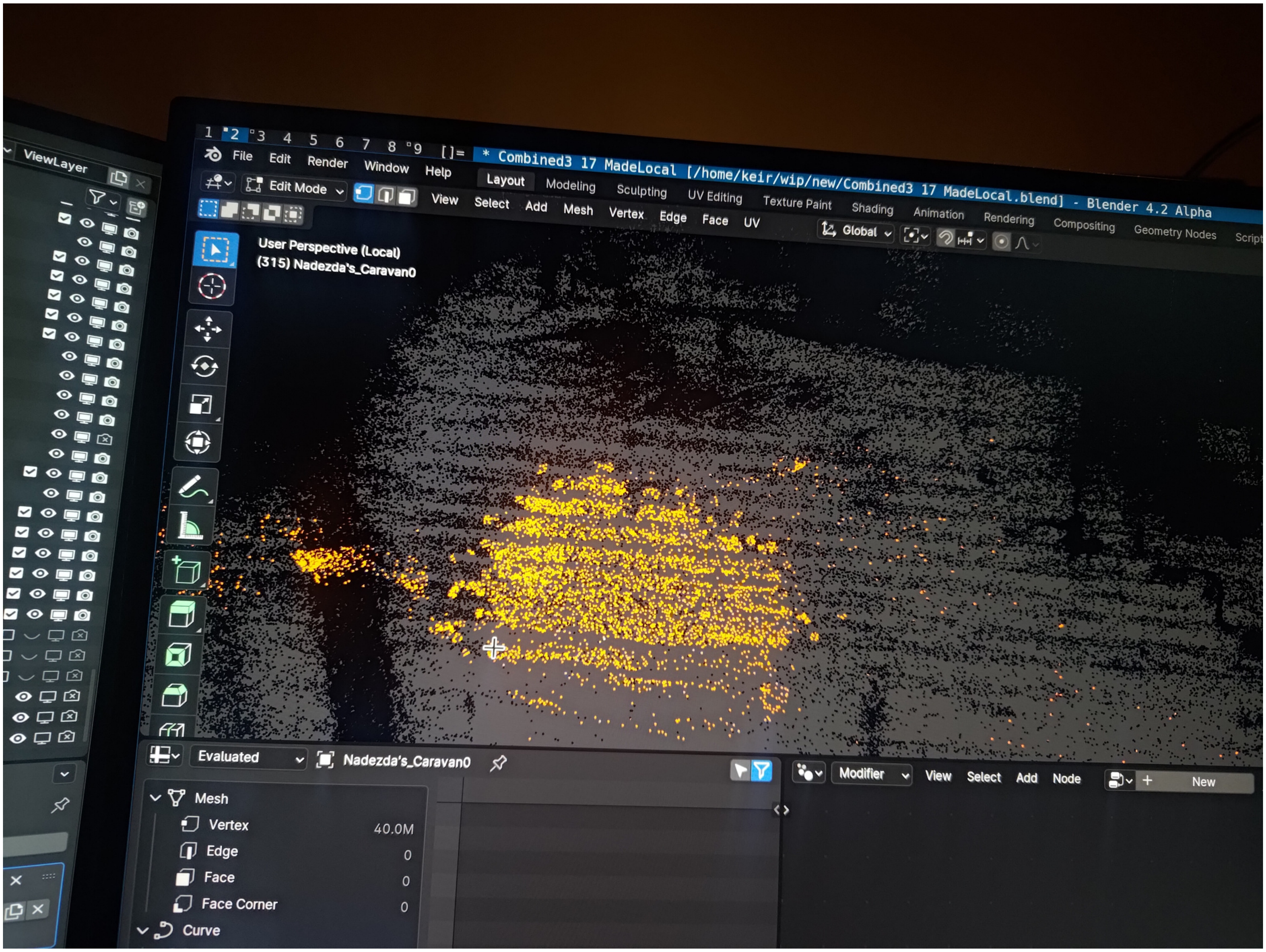

ined4 4 5 [/home/keir/wip/new/Combined4 4 5.blend] - Blender 4.2 Alpha
Modeling
Sculpting
UV Editing
Texture Paint
Shading
Animation
Rendering
Compositing
Geometry Nodes
Global
7600
7200
6800
6400
6000

Figure 43: This issue reared its head quite late into the process. I recognised the issue as a floating point precision issue, I relatively common problem all across computing. But I had never seen it inside Blender before. This issue manifests itself as a impreciseness and wobbly camera path as there is not enough floating point information. This is caused because I use such dramatically different sizes of locations and this happened at the smallest location when the movement is its most subtle due to the small scale. I tried to scale up the whole scene to fix this issue but found that the same issue persisted at the other end of the spectrum when I was in the largest environments. So the best solution I found was placing the worst effected areas as close to the center of the world as possible (0,0,0) as the precision issues are meant to be not as bad the smaller the number. This massively improved the issue to the point it was good enough, but not perfect, but it would require an entire remake of the scene to fix.


1 2 3 4 5 6 7 8 9 []=
* Combined3 17 MadeLocal [/home/keir/wip/new/Combined3 17 MadeLocal.blend] - Blender 4.2 Alpha
File Edit Render Window Help
Layout Modeling Sculpting UV Editing Texture Paint Shading Animation Rendering Compositing Geometry Nodes Script
Edit Mode
View Select Add Mesh Vertex Edge Face UV
Global
ViewLayer
User Perspective (Local)
(315) Nadezda's_Caravan0
Evaluated
Nadezda's_Caravan0
Modifier
View Select Add Node
New
Mesh
Curve

Vertex	40.0M
Edge	0
Face	0
Face Corner	0

Figure 44: Once the final layout of the video was finished I had to go and delete points manually that intersected with the journey I wanted to go on. To delete the points Blender lacks the tools to do this organically. So i have to manually paint a organic shape with lots of variously sized circles that give the impression of a broken up surface.

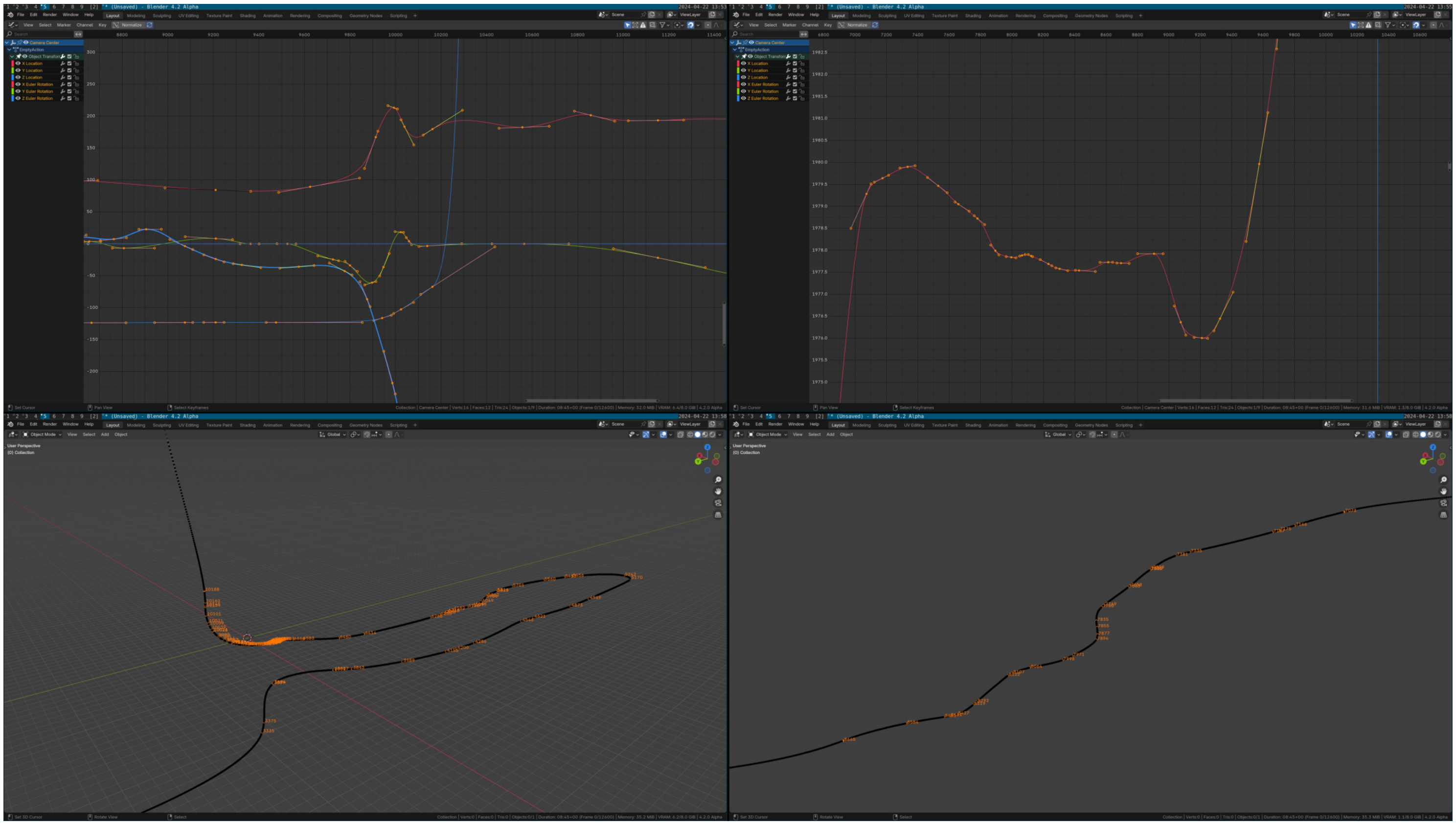


Figure 45: In this image I am showing what I actually animate with. On the top is the graph editor, where I edit the position and curve of path of the camera for each of its x,y and z position and the same for its rotation. These curves have to smooth but precise. There are certain positions in 3D space where I want the camera to go, and I have to design curves that will perfectly take me from one point to another without any noticeable camera movements. I developed a much deeper understand of these curves and how to work with them from a video by Freya Holmer where she discusses the root of the mathematics behind bezier curves and there different properties for animation. I learnt that there isn't a bezier curve that will produce consistent acceleration and so you may have to use a mixture of types of curves to achieve the best result for what you are looking for. I used mostly automatic curves, that match a more consistent acceleration curve, opting for a manual approach only when necessary for a very particular movement.

20 Video Development

Here I will show a chronological progression of different sections of the video. There was 44 itinerations of the main video not counting versions that where never rendered. This is a tiny selection of the footage I produced, keep in mind that each photo is one frame from a 8 minute video.

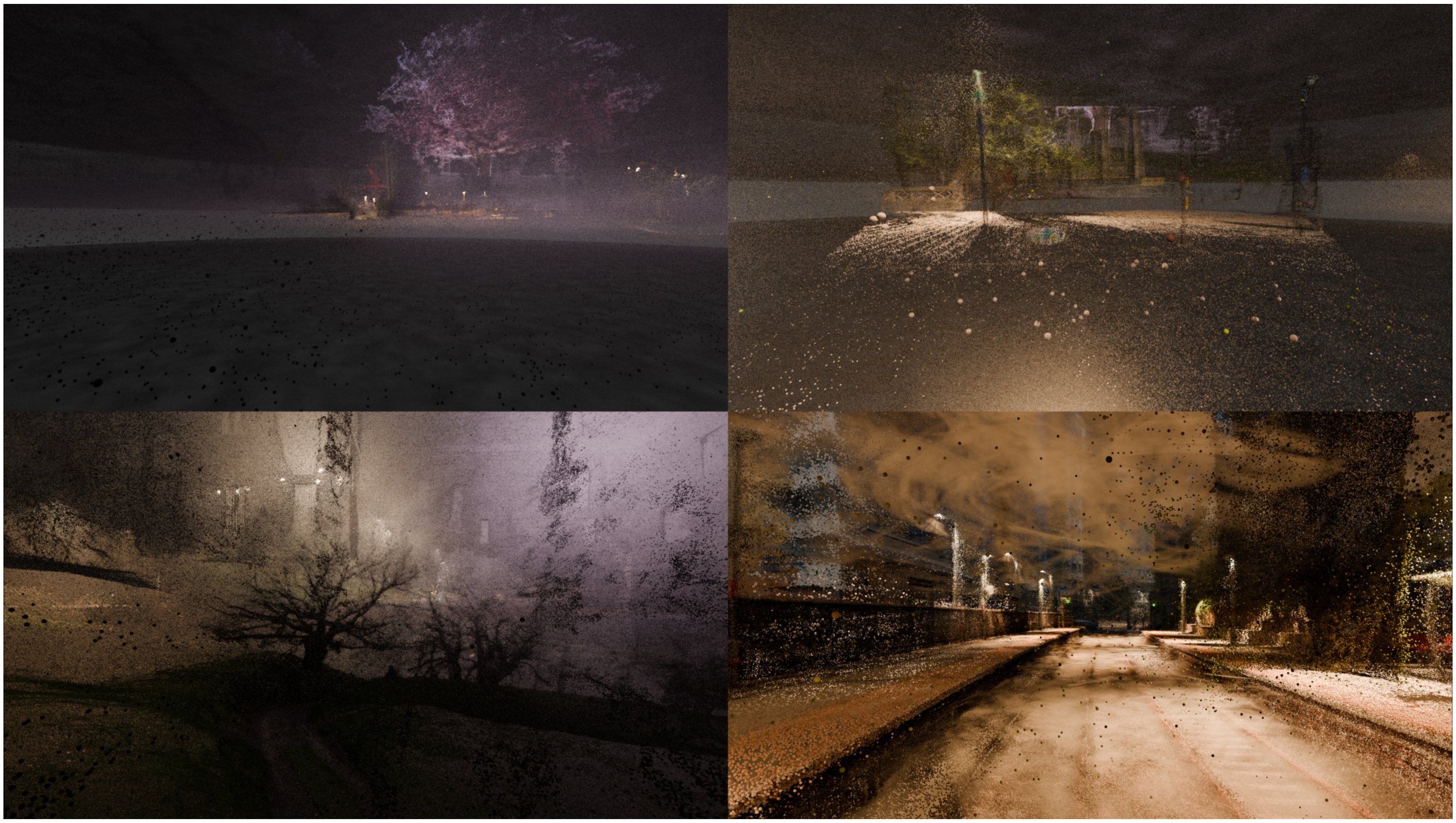


Figure 46: 8, 10, 15, 17. Here I am slowly testing initial layout tests and how the camera move through them as well as fixing lots of simple bugs, a example can be seen in the top right image where the frustum culling tool was deleting points that it shouldn't. And seen in 15, the bottom left image, I was testing if certain environment could also be brought into a night time version and retain detail, that I eventually decided against in this case as it was just too hard to render.

One of the big things I worked on in this remake was the lighting and shading. You have options when trying to shade a point cloud. You can use an emission shader that glows the colour of the point, which reproduces the lighting from the scene, but you cannot add new lights without the lighting shadows and baked point cloud lighting overlapping. Lighting a scene with lights in blender gives me a lot of control of the feel of the piece. Since there are existing shadows using a main sun light that is oriented to where the sun was on the day of capture, those main shadows won't seem out of place. Other lights were used for ghostly or magical effects in this video. I was inspired by artist Lorenzo Drago with his incredibly realistic first-person perspective video. Since I had already done so much work on the colour and atmosphere of this piece, I rendered it out as a EXR. This gave me exposure control, very much like a RAW file from a camera or log file from a video camera. This allows me to copy an effect from Dragos video which I thought was really subtle but effective. It is an effect seen in cameras and close to the human eye. It is the control of exposure to a bright element; in cameras these are meters. I metered the video in a small section directly Infront of the viewer to exposure for the journey ahead.
UE5 etchū-daimon station - Lorenzo Drago

I learnt to use blackbody colour for all their lights, to ground the work. Blackbody is a mathematic order for how materials glow, the process that make light bulbs work. This is useful to simulate warm and cold colour temperature lights. Colder blackbody levels result in warmer colours. This is also makes a more realistic light bulb, so you can never choose a colour that a regular light bulb couldn't make. Lorenzo Drago and Kane Pixel are a big influence on this work. Dargo makes incredibly realistic first-person perspective footage. Kane produces a horror web series called the backrooms. Kane uses blender and his level of realism and sound design is inspiring. I studied these videos to find elements of realism that I could use. One interesting method Drago uses a torch when in night-time shots. There is a disconnection between the light and the camera that gives the impression a person is holding it in their hand and swaying their arms. I made a realistic torch that the camera man is holding and illuminating their path. This was made using nodes, like materials, but for lights. I included the rings you sometimes get in torch light, directly inspired from Drago. This example is really simple, placing lights in their correct positions in the point cloud. Relighting the scene like this really adds atmosphere and control the scene lighting when they are physically motivated. Limal spaces are lacking in people and purpose, another subtractive method.

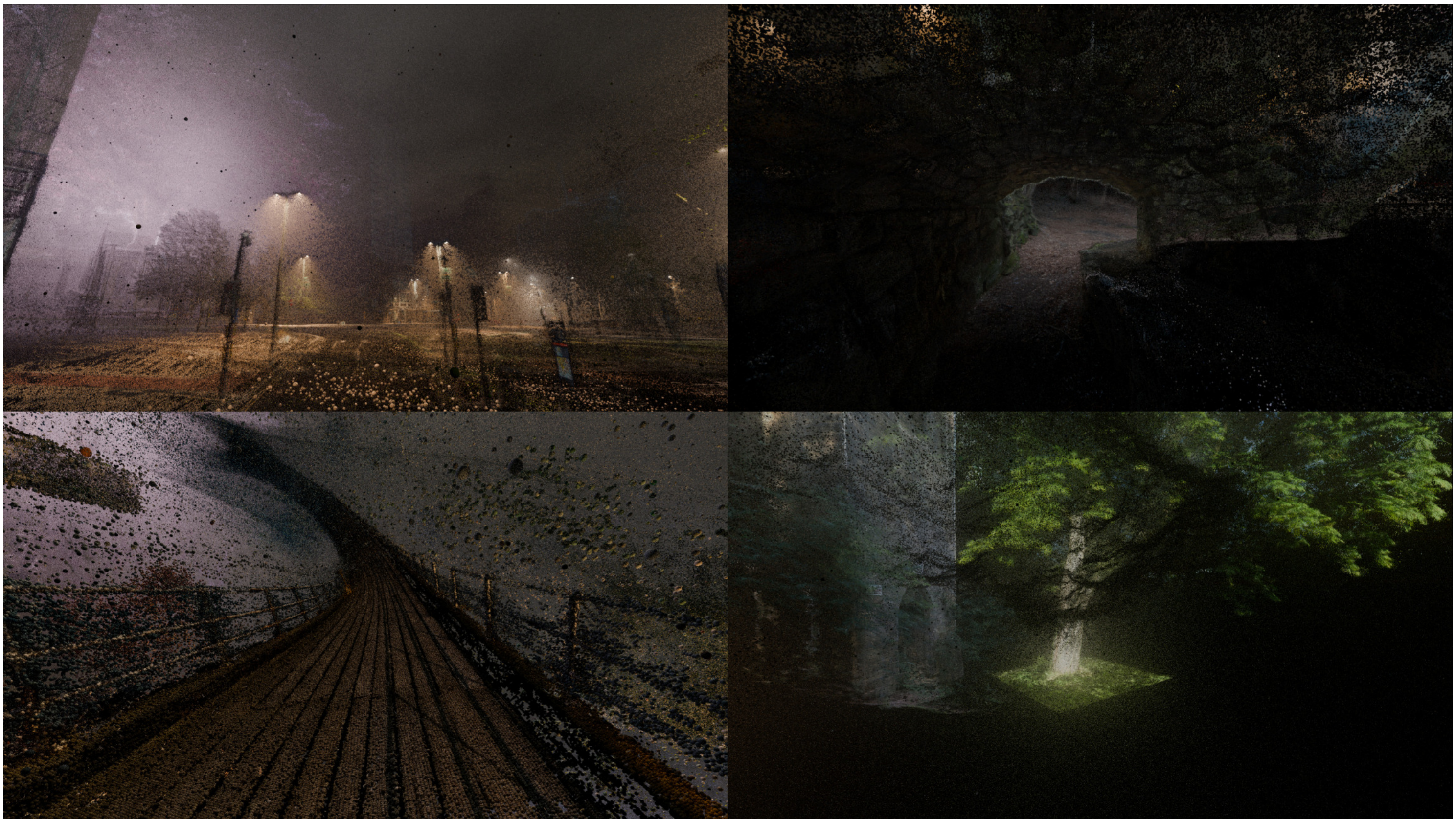


Figure 47: 19, 20, 21, 23. Around this point is where I was most happy with the fog in the scene. However due to performance issues this had to be tamed in. In the bottom left we can see my first tests with twisting Whitby pier in a video. The main purpose of the twist was so that we could end up above everything to look back down, Whitby pier would be that transporter, that place of transition, between the known and unknown, the rocket pad.

Some point clouds aren't easily navigated in a seamless way. Making paths through the point cloud is key for the journey, the viewer needs to know where they are headed so the camera makes justified and motivated movements. Not having the camera at a set scale throughout the video causes technical issues. When travelling from a large point cloud to a very small scale one, the motion of the camera must be more subtle to match the size of the environment. For example, if you kept the same amplitude of a camera bob (the motion seen through a head mounted camera, especially while walking) in a smaller scale point cloud, the camera would move up and down past the small point cloud, rather than the scale of the animation scaling down to that of the smaller point cloud, camera bob is dramatically smaller, but it is the same in reference to the environment. The speed of the camera also must be slowed for small point clouds, as if you are still travelling at walking pace, you would travel through a small point cloud in seconds. This all effects how the Graph editor can be interpreted. Usually, you can filter key frames in the animation, to smooth them. But if you smooth the entire animation, now the animation for the small point cloud is being affected too much. When blocking out the shots you have to time correctly how much time it will take to traverse between small and large point clouds.

Camera animation is one of the main themes of my work therefore, I have researched the likes of Ari Aster, Darren Aronofsky, David Fincher, David Lynch, Gaspar Noe, and Satoshi Kon, who are film directors that are known for their distinct camera work when it comes to these complex shots in their films. Camera animation can be a narrative element. It is how things are shown, how the viewer gains information, and the emotion of that experience. The camera can be a diegetic element, or a passive onlooker.

For example, Fincher focus' on lifeless, often robotic shots. The camera will effortlessly move into position, framed perfectly. 'I just love the idea of this omniscience, like the camera it just goes over here kinda perfectly, and then it goes there kinda perfectly, and it doesn't have any personality to it, it's very much like what's happening was doomed to happen.' - Fincher.

Whereas, handheld camera work can create a sense of intimacy, urgency, or rawness in a scene providing an immersive experience. As explored in 'Max Payne, Kane & Lynch, and the Meaning of Ugly Games' by Jacob Geller, the camera movement often seen in third person perspectives are that of a real camera man running behind the protagonist, with a real camera subject to natural and digital artefacts, camera bob and water drops on the lens. This has become a staple of the gritty realism seen in film and videos games, but also in documentary-style filmmaking or to convey a sense of chaos or instability.

Noe works with a mixture of handheld, first person-perspective and an ethereal, ghostly perspective, having the freedom to view things from above and gracefully float over to the subject. Noe's work seems to build upon the foundations that the likes of Fincher have built. Taking this robotic camera and using those techniques to embed the themes of the film in the motion itself. He also extends the length of these shots, for minutes a camera will traverse across the scene, giving the audience a strong understanding of the environment.

For Ari Aster's use of surreal and disorienting camera movements, which focused on exploring the subconscious and irrational aspects of the human psyche. Aster's use of subverting expectations with camera motion, where a rotation or dolly continues past the subject to something that wasn't the original focus, is useful for big reveals. His work adds to the dreamlike and nightmarish qualities of his films, which often deal with the horrors of the mind. He often employs long takes and camera movements that create a sense of unease or disorientation for the viewer.

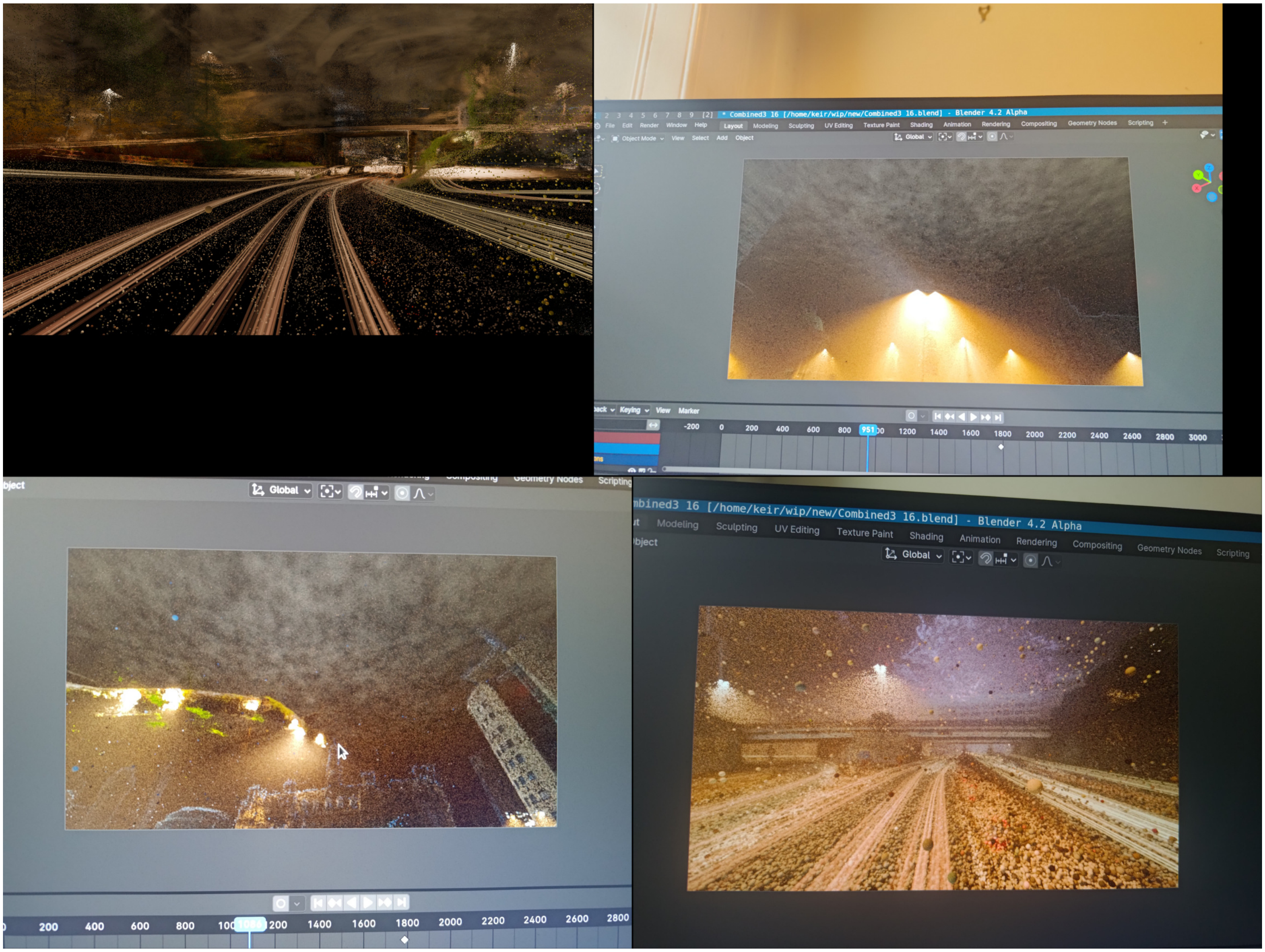

Combined3 16 [/home/keir/wip/new/Combined3 16.blend] - Blender 4.2 Alpha
Layout
Modeling
Sculpting
UV Editing
Texture Paint
Shading
Animation
Rendering
Compositing
Geometry Nodes
Scripting
Global

Figure 48: Different cloud variations, from highly detailed cloud to more abstract to a dense fog. I preferred the dense fog in terms of the feel and atmosphere, but it limits the vistas you can have, as you can't see far into the distance. The high cloud also gave quite a nice ceiling to the space, like a gentle blanket. Also in these tests one of the biggest investigations was how long different volumes took to render, the dense fog takes the longest, but any area of dense fog is quite hard to render quickly. Due to this I was constantly trying to find a compromise for the best image that I could actually render rather than the best looking image.

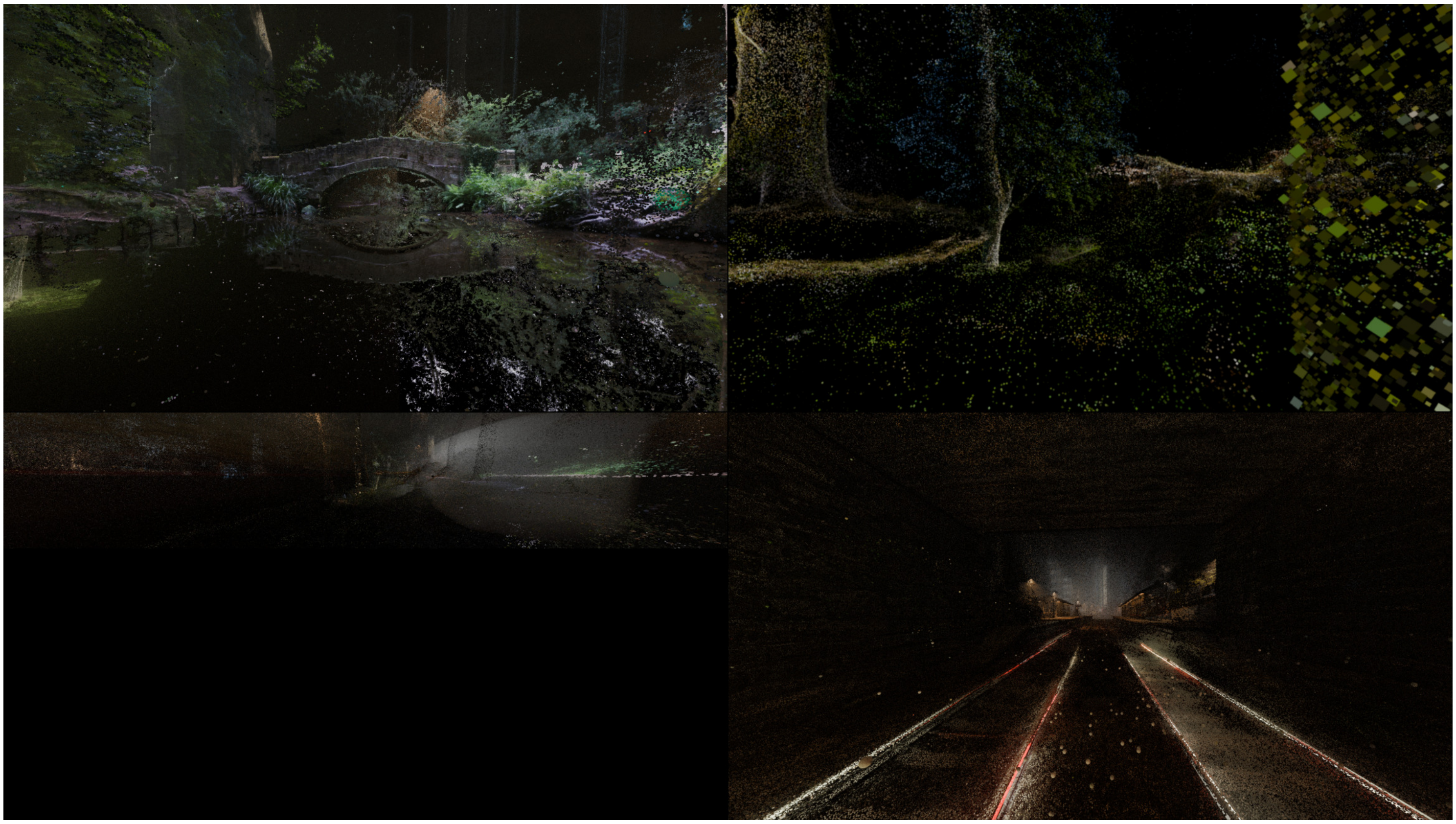


Figure 49: 26, 30, 32, 37. In the top right image the points aren't spheres this is because I did test renders in a simplified mode that allows me to very quickly (24 hours) render the whole video. This was done at this stage as I had just about figured out the main layout for the video so I needed to re-time the animation. This is a process where I have to stretch certain parts of the animation to make the video flow at the right speed. In the bottom right image you can see one of the biggest issues I had to face in this project. I had designed all of the fog volumes for each point cloud, but in the full video I found that you could see the outline of this object very easily. I tried lots of methods like fading it in and out and changing the density dependant on your distance to the fog but non of this solutions worked. What I ended up doing was animating the density of the fog around the camera itself, and then animated its properties to match the settings I initially had for each section.

Another notable film that I have studied is 'Victoria' (2015). It is a film that is notable for its use of a single, continuous shot that follows the protagonist throughout the course of a night. This technique creates a sense of realism and immersion for the viewer, as they feel as if they are following the character in real- time. There is an invisible tether between the camera and the protagonist that stretches and contracts throughout the film showing us the perspective of being there, you are not shown a cut in of the actor's face to show the emotion, the entire perspective of Victoria is of actors in an environment and the traversal between spaces. There is no edit to skip to a new scene, you have to travel there. There is a realism, intimacy and familiarity to the film that I hope to reproduce with these methods.

I developed my own style and eye for this kind of animation from playing games like Microsoft Flight Simulator. When learning to fly a plane you develop muscle memory for when to bank and prepair for a turn, the planes follows a predictable path, just by its angle and speed you can understand its trajectory. This was an extremely valuable lesson that allowed me to create smoother animation, by considering the banking of the camera and how that allows you to make certain turns.

First-person view (FPV) refers to a perspective in which the camera or viewpoint is positioned as if it were the eyes of a person. In other words, the user sees the environment from a realistic perspective, the view a person actually in that environment would be seeing. This technique helps ground the realism as distance and scale can be understood. This affects how big the body of the viewer feels inside the seen. Their digital proprioception needs to be understood to design a path through an environment that doesn't make the user concerned about the camera colliding with something. FPV is proliferated video games and is mandatory in Virtual Reality (VR). This is the standard for immersive experiences as the view is made to simulate the human perspective and there is a wealth of techniques to create immersive, realistic FPV. This momentum gives a great advantage over a CGI based system that isn't controlled by physics. The camera being locked in a physically environment gives it a sense of realism and a type of proprioception, where you can feel the momentum of the camera and it feels off when physical laws are not followed. This is how you avoid robotic camera movements.

This idea has been experimented with, through a range of physically based situations the YouTube channel Corridor crew has a series on ‘GoPro on a ______’ inserted with object like a sword, football or a tire. This is very useful reference footage to learn how the camera moves through space under its own gravity, or under the control of human hands.

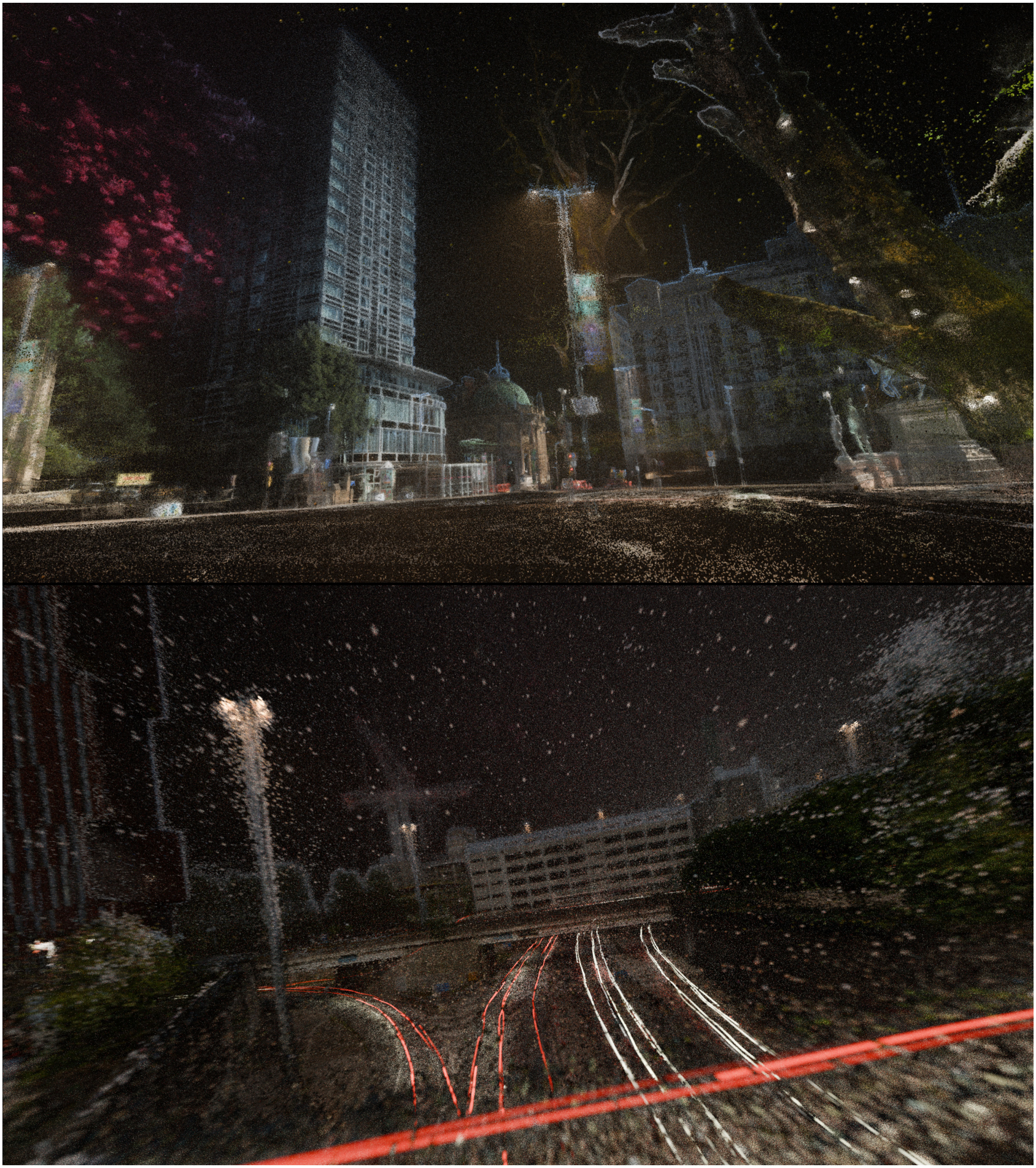


Figure 50: 42,43. In these last two iterations I added depth of field and motion blur which dramatically increase the render time so I couldn't test with it earlier as there was so many other problems to solve. I am not enterally happy with the video, but never expected to be, there is always more time I could spend perfecting it.

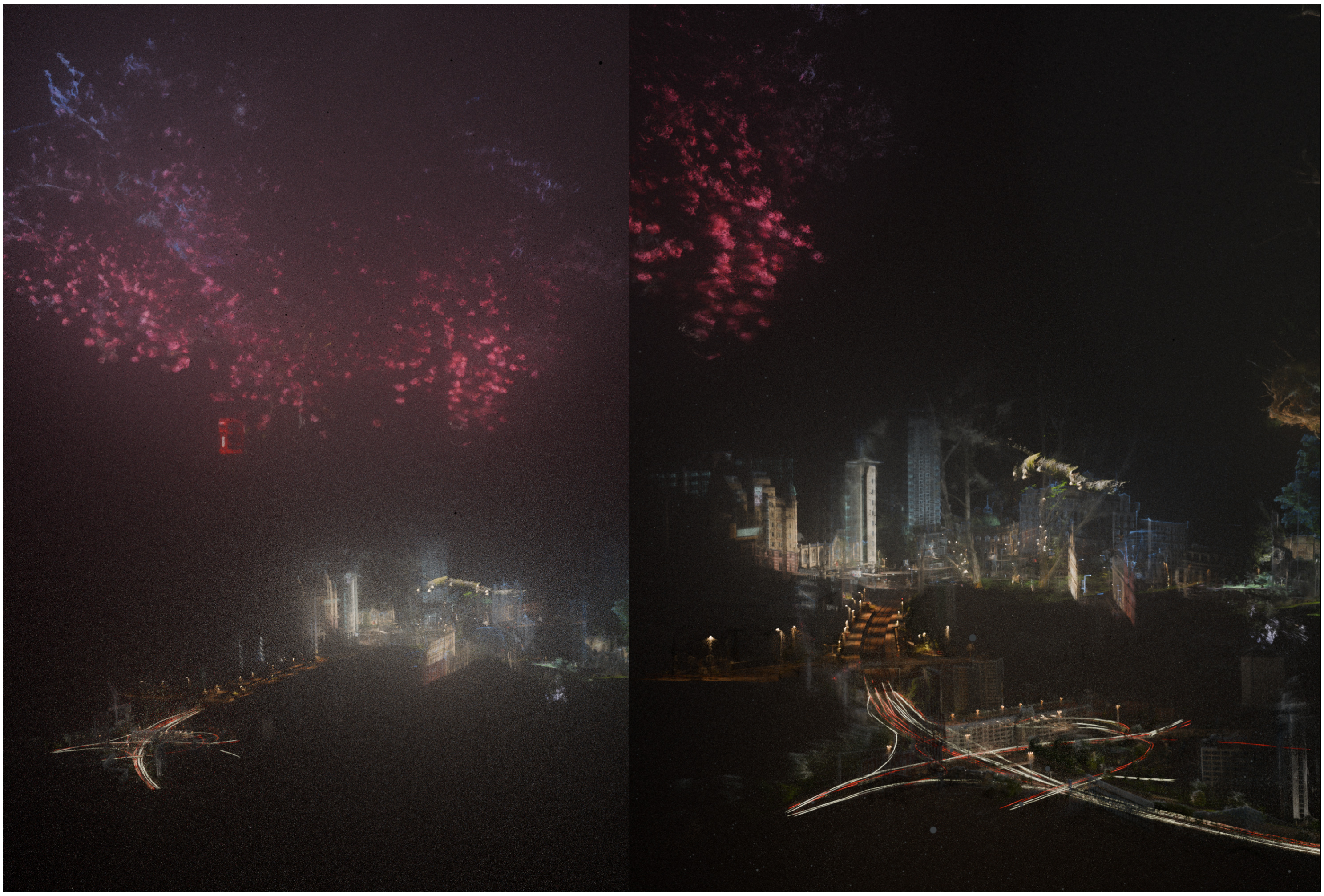
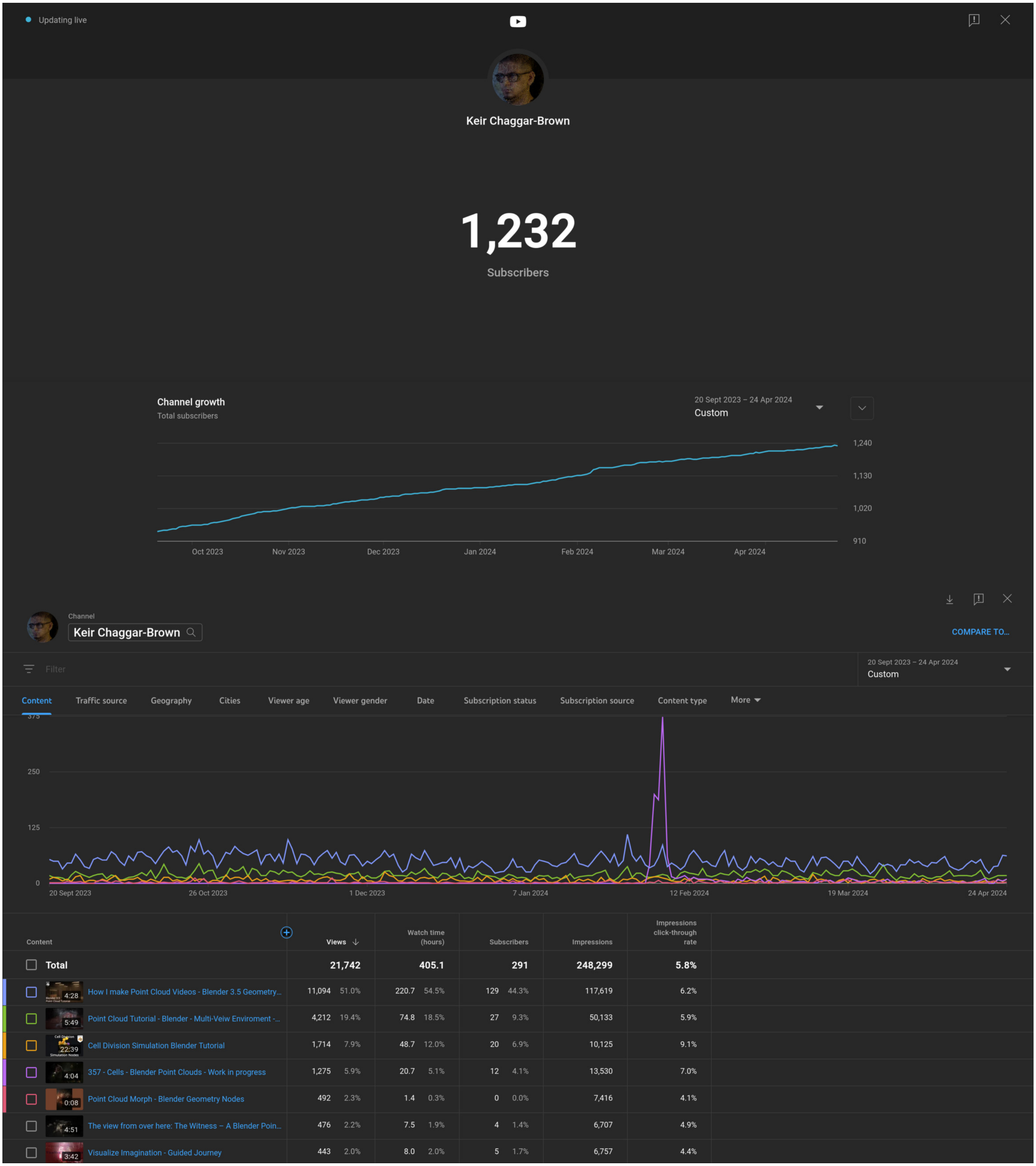


Figure 51: The image on the right was used for the GSA catalog. I tried to find a angle that showed off a large portion of the journey as well as the abstract nature of point clouds. I also was exited to show off this perspective as I struggled to get this more surreal camera perspective in this video as it didn't quite fit the journey.


Updating live
Keir Chaggar-Brown
1,232
Subscribers
Channel growth
Total subscribers
20 Sept 2023 – 24 Apr 2024
Custom
1,240
1,130
1,020
910
Oct 2023
Nov 2023
Dec 2023
Jan 2024
Feb 2024
Mar 2024
Apr 2024
Channel
Keir Chaggar-Brown
COMPARE TO...
Filter
20 Sept 2023 – 24 Apr 2024
Custom
Content
Traffic source
Geography
Cities
Viewer age
Viewer gender
Date
Subscription status
Subscription source
Content type
More
375
250
125
0
20 Sept 2023
26 Oct 2023
1 Dec 2023
7 Jan 2024
12 Feb 2024
19 Mar 2024
24 Apr 2024
4:28
5:49
22:39
4:04
0:08
4:51
3:42

Content	Views ↓		Watch time (hours)		Subscribers		Impressions	Impressions click-through rate
☐ **Total**	**21,742**		**405.1**		**291**		**248,299**	**5.8%**
☐ How I make Point Cloud Videos - Blender 3.5 Geometry...	11,094	51.0%	220.7	54.5%	129	44.3%	117,619	6.2%
☐ Point Cloud Tutorial - Blender - Multi-Veiw Enviroment -...	4,212	19.4%	74.8	18.5%	27	9.3%	50,133	5.9%
☐ Cell Division Simulation Blender Tutorial	1,714	7.9%	48.7	12.0%	20	6.9%	10,125	9.1%
☐ 357 - Cells - Blender Point Clouds - Work in progress	1,275	5.9%	20.7	5.1%	12	4.1%	13,530	7.0%
☐ Point Cloud Morph - Blender Geometry Nodes	492	2.3%	1.4	0.3%	0	0.0%	7,416	4.1%
☐ The view from over here: The Witness – A Blender Poin...	476	2.2%	7.5	1.9%	4	1.4%	6,707	4.9%
☐ Visualize Imagination - Guided Journey	443	2.0%	8.0	2.0%	5	1.7%	6,757	4.4%

Figure 52: This year I have had 22 thousand views and 400 hours of seen. Growing my subscriber count from 900 to 1230. This has brought countless conversations and contacts and continues to be how my work exists outside of the gallery space.

21 Inspiration / Research

21.1 Films

Here I will list major inspirations that have permeated my subconscious. This is what I can find of the media from my childhood up to present day that evokes a similar feeling to what I want to make.

- Victoria
  A one shot video, I use it for inspiration and ideas around camera motion.
- Requiem for a Dream
  Its dreamscapes and soundtrack are incredibly evocative
- Enter the Void
  A one shot video, I use it for inspiration and ideas around camera motion. Also this film focuses on first person perspectives, alike to a video game. Psychedelics play a large role in the visual pallet of the films creating extremely surreal and dream like environments out of every day places.
- Eternal Sunshine of the Spotless Mind
  This film has incredible dream sequences mostly in the use of the changing and morphing of faces so the back of the head is on both sides of the head and props like bookshelves turning blank as the dreamer leaves the dream.
- Climax
  This film said by many to be a horror for me is more a embrace of the void, an embrace of chaos and disaster. This film is also by Gaspar Noe and has his signature on shot style, being great research for camera motion.
- For All Mankind
  The pinnacle of NASA footage from the Apollo missions. This footage contains some of the most beautiful and human inventions in a religious manner.
- Shadows of Forgotten Ancestors
  A Ukrainian film from the 1960s. The authentic nature of the locations and people are enhanced by the films age and budget. It is a mystical film to try and follow as a English speaker, but its ability to communicate through that barrier is one that interests me. This film also contains traditional folk songs that are some of the most powerful recordings I have ever heard.
- Koyannisqatsi
  This film is a no plot documentary, communicating in only metaphor and the Kuleshov effect. But its message about ‘a world of turmoil’ and the ending of a rocket exploding and falling to the ground still spluttering flames, encapsulates a horrific reality that inspires me to this day.
- Everything Everywhere all at once
  A more anime style dream scape, with very simple but extremely well executed visual effects. The style and narrative of this film inspires a lot of my VFX work. The very emotional and important part of the film for me is its sort of thesis, that yes nihilism is correct, but you cannot go about life like that, you have to find a purpose and meaning for living. This is quite core to why my video loops back to the cells after the collapse of everything. You have to rebuild, you have to keep on going.
- The Fountain
  A religious science fiction film depicting a particular scene of a man on a floating patch of land with a great tree, in the vast expanse of space. The evocative imagery is capturing something that I am trying to replicate.
- Last and First Men
  This film I remember for its failure at being anything good. It was said to try and emulate some of Koyannisqatsi’s qualities, however, it fails at being human in the slightest, or delivering any journey. This is what I know I want to avoid.
- Sunshine
  Is another religious science fiction film where characters very close to the sun are lost in its nature, they are in some way addicted and in awe of the star. This allows me to finally understand my work as trying to be in some way religious science fiction.

This list is of films that are either deeply embedded in my childhood and/or have scenes of micro and macro. The use of scale is one of the main thing I use for my dream scapes, and it is from childhood that this fascination grew.

- Toy Story
- Big Cook Little Cook

- The Borrowers
- Aritetty
- Alice in Wonderland
- Willy Wonka & the Chocolate Factory
- Time Bandits
- Narnia

21.2 Music

This is some music that inspires me texturally or emotionally.

- everything perfect is already here - Claire Rousay
  This ambient album contains field recordings beautifully mixed and mastered.
- Fred Again
  The album 'Secret Life' made with Brian Eno is particularly poignant for me as it is about having a secret life where you worry about someone you love. This albums use of the voice as a instrument and steady tone for a very meditative and contemplative experience.
- Lankum
  This band uses noise and distortion in a very powerful and religious way.
- Slowdive
  This album reminds me of those childhood journeys in the back of the car late at night, a early 2000's warmth.
- Lux - Voces8
  This is a choral album. Since religious sounding music is such a big influence some Christian music is very useful to find those 'god' sounds.
- Candy Says - Immortality - AHNONI
  A version of candy says performed by AHNONI at Lou Reeds last performance. This was used in the game Immortality as one of the final scenes where the protagonist is overwhelmed by the sheer beauty of this very human creation.

These artists make a mixture of ambient adjacent music. They are some of my favourite artists and I often use their music to test out what kind of track I want to use for my video before creating my own.

- JPEGMAFIA
- Jon Hopkins
- Four Tet
- Tim Hecker
- Oneohtrix Point Never
- Blank Banshee
- 36

21.3 'Art'

21.3.1 Point Cloud Artists

This is a list of artists I have found that create point cloud works. I use this list for motivation as it is a very small genre I feel like I can personally push boundaries, I am not aiming to do exactly that, but it is motivational.

- Ance Janecia - YouTube
- Ance Janecia - RCA
- Ance Janecia - Convoluted Landscapes
- Anh Tran
- Benjamin Bardou - Website
- fabio video 1

- fabio video 2
- Flame Red Images
- grade eterna
- JAMPL___BIM
- Midge ‘Mantissa’ Sinnaeve
- Shahriar Shahrabi
- Vj Catalyst
- Yusuke Koroyasu
- zombieblazer

21.3.2 Other Artists

- Forensic Architecture
  Forensic Architecture uses a lot of the techniques I have developed for my work, it is extremely inspirational to see these tools being used in such a sophisticated and beneficial way. This is one possibility I can see for my future is work like this.
- Ethan Gore
  Ethan is creating a game engine but is exploring with the micro and macro with photogrammetry. This is very compelling as a video game.
- Kane Pixels
  Kane Pixels is a very young creator, making horror videos inside of blender. This content is really interesting to try work out how he achieved such a high level of realism. Hoping to use these techniques in my own work.
- Kilian Bron
  Kilian is a downhill mountain biker, but I included him in this list due to how he is a great example of ‘Go-pro’ style flowing movement. The speed and rhythm of these videos is greatly useful of how to plan camera paths and maintain flow.
- Marijn van Vilet Visualization of a fully connected neural network, version 1
  This video by Vliet is a amazing display of data visualisation. A topic very close to photogrammetry in concept. The way this video shows the machine ‘thinking’ is really cool.
- Posy
  Posy creates a wide variety of content that explores a lot of display technologies that interest me as a digital artist as I am always looking for new ways to bring my work into the real world. I found Posy from his video on ‘Motion Extraction’ and ‘Hot Water Colors’ which are fascinating explorations of physics and technology for a visual piece of art.
- Elena Helfrecht - PlexusPlexus is a book of photographs, photos of mostly mundane things vividlly decontextulised from their surroundings. The book is hauntings, but what makes the work so interesting to me is how some pages throughout the book are closed togther at the edge, you can just peak inside to see that their is infact text on the inside. One interpretation of this work is that it is the owners decision to cut into the pages to see what lies between the pages, or to leave it, untouched, but unknown. The images throughtout this book have massivley influenced how I situate objects in the void, objects that sometimes appear familiar, but also at the same time, somthing that you do not recognise, jamais vu. I also am facinated by the use of a flash in Helfrechts work, there is often only one source of illumination, that being the camera itself. The light that bounces off when shot like this catched a flattened version of the enviroment, there are very little shadows to understand the scene with, the image goes from almost overexposed to pure black without much inbetween to dirive context from.
- Aristotle RoufanisRoufanis creates massive photos of cityscapes, in a moody atmosphere and most importantly devoid of most signs of life. Roufanis collages together thousands of photos together to leave only a handful of lights on. The images are so high resolution that you can see the inside of these rooms and maybe the odd person washing the dishes. These are immense photographs that inspire the atmosphere and use of limited lighting at a very paricular time between dusk and dawm, as the sun leaves the sky in a alien glow, not bright enough for the colours not to be overwhelmed by the dull blue.

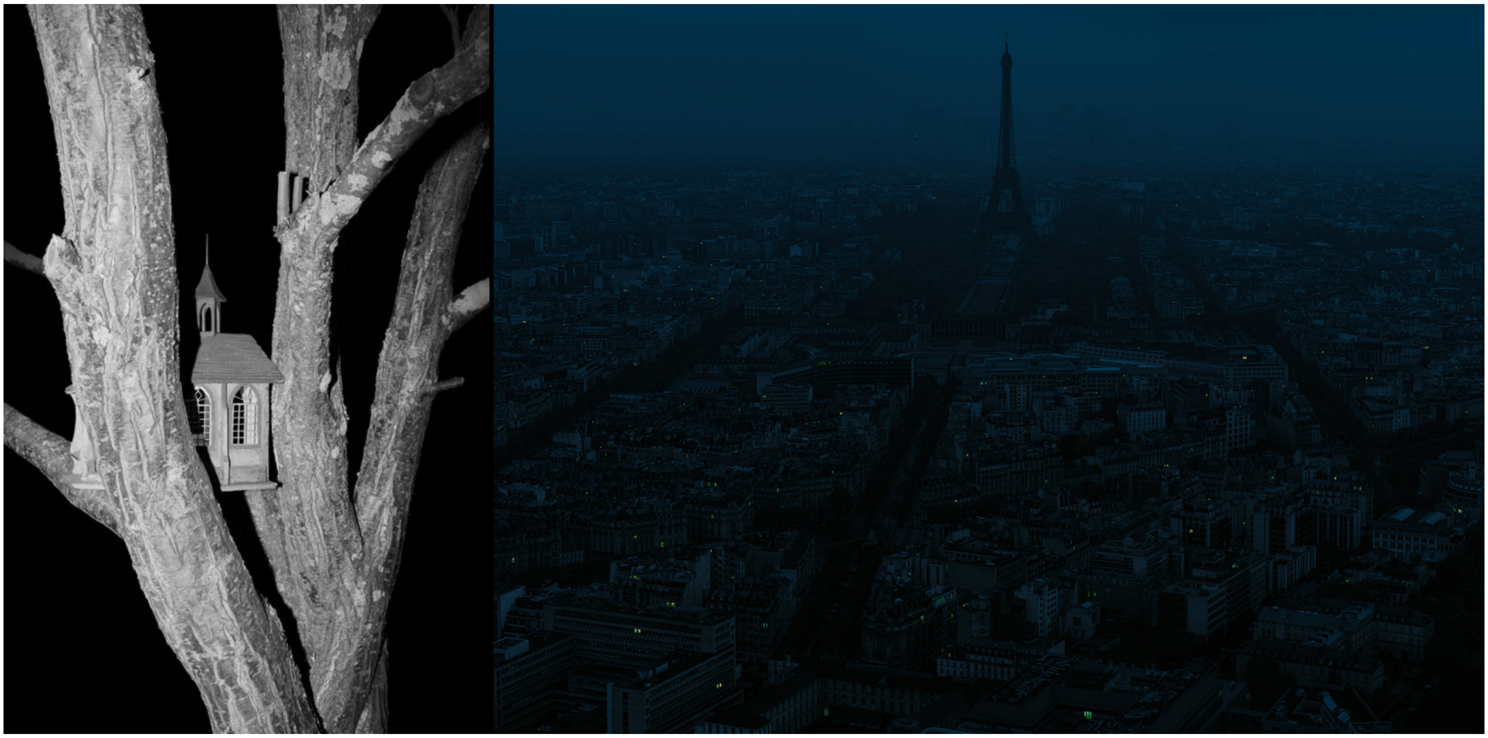


Figure 53: On the left is a photo from Plexus and on the right is a photo by Roufanis in his series Alone Together.

21.4 Games

- Immortality
  Immortality uses similar looking things to jump between desperate footage is a really interesting dreamlike a metaphorical tool. Also the narrative of the game, where two beings try to make the perfect piece of art, slowly begin to give up due to not being able to do so is a narrative that allows lots of collages to be formed.
- From Software - Dark Souls / Elden Ring

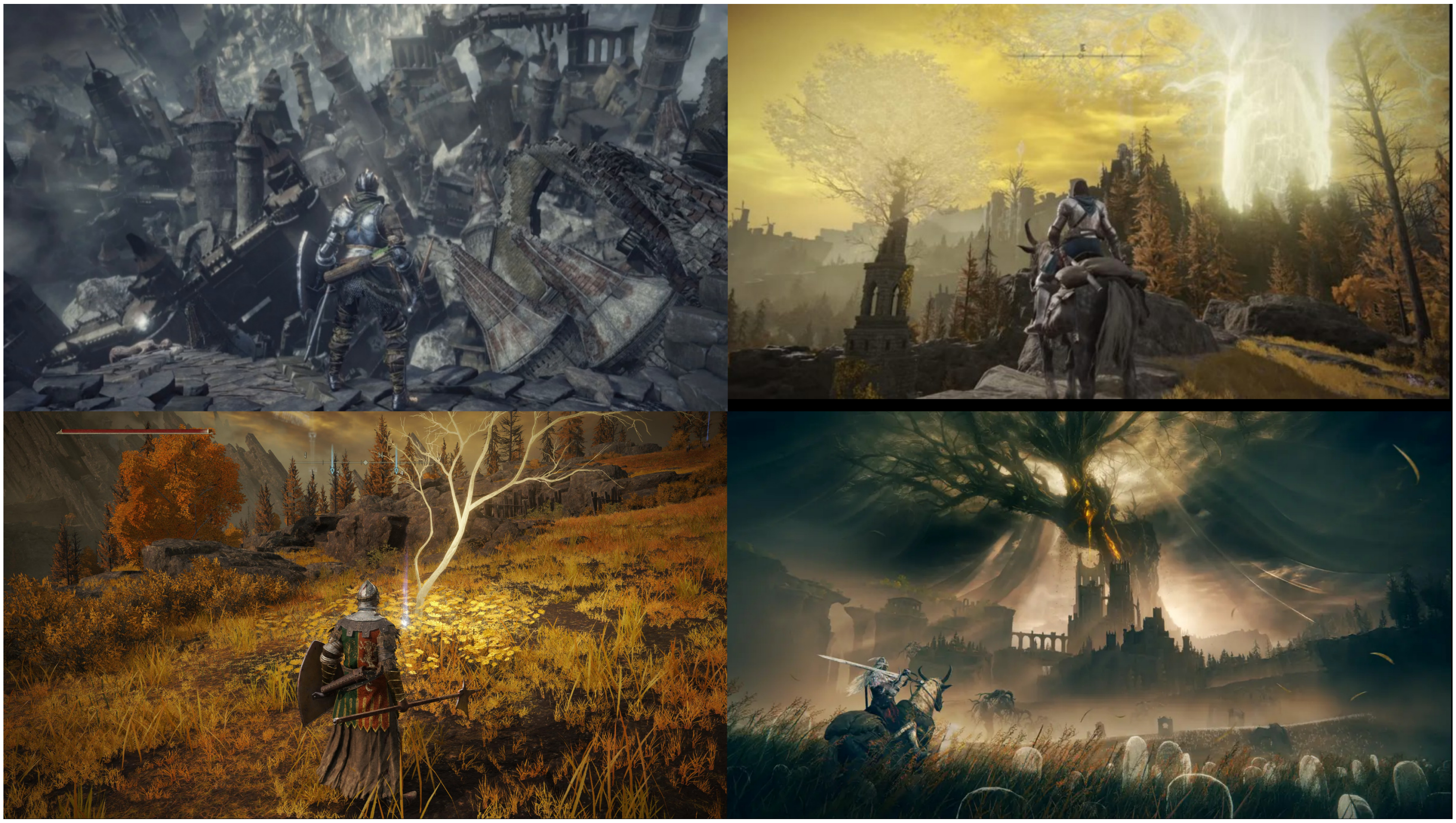


Figure 54: The Dark Souls franchise including games like ‘Elden Ring’ are huge inspirations for my work. Their vistas and journeys greatly help me design worlds of my own. The journeys often lead you along landmarks you can see in the distance and then at some point, it will link back to a previous area in a surprising way. Light returns when wood is burnt back into the skies. The energy that is released by burning is the energy that the sun put into the wood. But there is just somthing grand and massive about the trees in Eldren Ring, I played the game enterily after getting it, and it wasn’t to play it, it was to explore the world’s they had built. I cannot say that their is one singular influence from these games as there world design and atmosphere is the best in class production.

- Disco Elysium
  This games use of the human brain and psyche as a narrative and game play is genius. This is something I would like to explore, the use of the limitations of ones self to achieve narrative goals.
- The Witness
  The witness as previously discussed is a great narrative inspiration.
- Outer Wilds
  This games use of a very small but dense world gives a great sense of understanding once completed. It is amazing to learn for yourself how all the cogs of the narrative fit together, in a very contemplative manner.
- Death Stranding
  Death Stranding is one of the strangest games I have ever played, however, its core mechanics are revolutionary, its walking. The entire game is about navigating a landscape and delivering packages. This gives the player a unlimited amount of time to contemplate the narrative allowing for such a strange but metaphorical story.
- Control
  Control is a game that uses a lot of ray tracing in its graphics, that basically means that it has a lot of realism that was unobtainable for most games ever made. This level of graphics allowed me to understanding how to use lighting in a digital environment, as this game uses its technologies to deliver amazing visuals.
- Flight Simulator
  Flight Simulator is most interesting in its weather system. The game allows you to design the entre sky with complex cloud dynamics. This is another place where the technology of the game taught me how to implement something like that myself. Flight Simulator is one of the games in which I learnt how to design smooth animation. If you learn how a plane

flys, you can use this knowledge to animate cameras. A plane cannot turn quickly, and all its movements are telegraphed before they happen. Small adjustments can have the impact long down the line, so it is about setting up your trajectory and planning ahead for the upcoming obstacles.

- Tetris Effect Another game in the long lineage of Tetris games, however, Effect is the game that realised the meditative and religious place that Tetris exists in society. This is a amazing example of gameplay and meditation combining into a greater whole.
- Stanley Parable
  In the Stanley Parable there is a gag where you get on a elevator and the doors close, you wait for some time only to come back to the same location. The gag is that the elevator was not moving, only vibrating in place. This is what I want to try for my degree show installation, for people to believe that the elevator is moving.

21.5 Technology

21.5.1 'Holographic' Displays

This is a list of 'holographic' displays. Even though a digital hologram is impossible, and many technologies are fakes, these are a selection of either expensive or impractical new ideas on how to actually implement a hologram into the real world. The reason why this interests me is that I am always looking for new display technologies to display my work on, and sometimes I feel limited by the flatness of the screen. A hologram would allow me to break into the third dimension.

- Flicker - a spherical display

- Hologram V0.1?

- Looking Glass

21.5.2 Blender

This is a list of digital tutorials or artists who I use for technical understanding and inspiration in how to experiment in the digital realm, as it is in understanding and finding new tools to break and misuse that I create my work.

- Simulation in Blender 3.6 (Geometry nodes tutorial)
- Cartesian Caramel
- CGMatter
- Default Cube
- Christopher 3D
- Code Parade
- Corridor Crew - VFX Artists React
- Entagma
- Erindale
- Freya Holmar
- GifCo
- Gleb Alexandrov
- higgsas
- Ian Hubert
- Nicko16
- Tutorial: Polyfjord - Making a Physics-Based FPV Camera Rig in Blender
- Seanterelle
- Sebastian Lague
- sirandalot - Make Your Renders Unnecessarily Complicated
- William Faucher

22 Installation & Thoughts

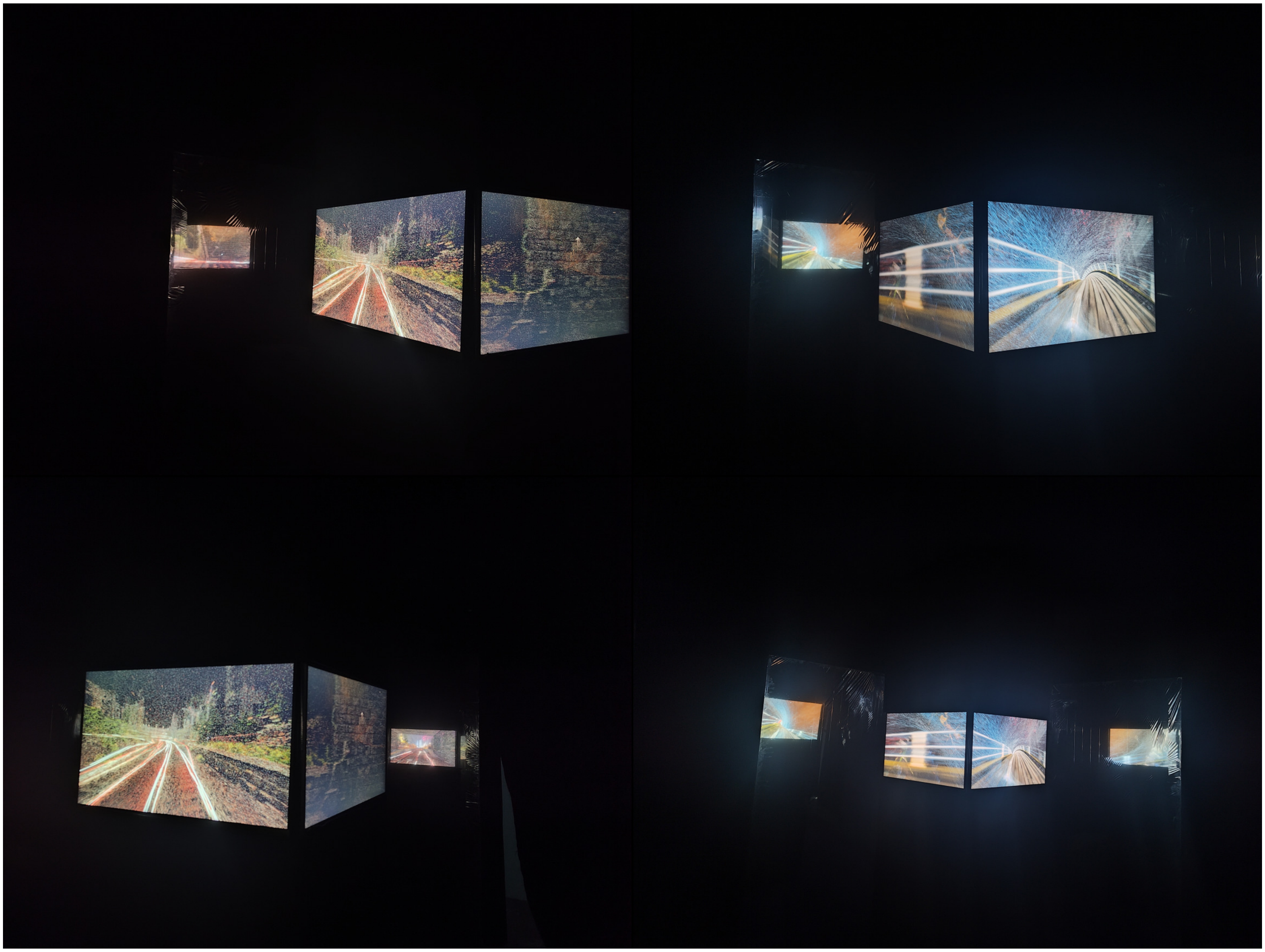


Figure 55: Images from the final installation

Please find the final video on my YouTube channel. The main video rendered in time, at a lower quaility that I was happy with, but I had to accept it. However, the simulations where both taking a long time, even with the server I was given. So I simplifed the simulations as much as possible so they would finish in time. Once they where finally finished I had to render the frames into a video. This was extemely more challenging than I expected, since there render was more noisy than I was hoping for, most video compression algorithms really struggle to get the video into a playable manner. I was struggeling for quite a while, experimenting with ffmpeg to try find a encoding method that would work, but ffmpeg is very complex and I do not have the understanding to do this effectivley. So I had the idea of uploading to YouTube and downloading the result, YouTube's encoding is very good at making files work, it won't be at an ideal quailty, but it will be playable. I did a significant amount of planning for the degree show installation as I had planned to build everything back in Leeds from the friday before the installaton, and transport it up Glasgow for Tuesday. I did this for the speed of fabrication, I know my workshop well back home, so I can make things very quickly without much hassle. This just ment I had to arrive in Glasgow ready to install with every ready. The install went relativley smoothly. I started by planning what would need to be installed first as some jobs would be harder with things in the way. I also had two helps, both hard workers that very much helped make the install very seemless. I designated the helpers to start with the fabric for the ceiling as I started to make the frames for the mirrors. Once they finished with the ceiling they continued onto the walls and soon the whole room was dark and quiet. I spent the next day with the other helper putting together the mirrors, once they where complete I had to make a desision about where we where going to place the mirrors. I had inital plans to screw the mirrors through the carpet, but once we gave that an attempt, it was obvious it wasn't going to work, I made the good desision of sleeping on it, since we where so far ahead of my schedule. I came back the next day and realised the mirrors could just be placed at the ede of the carpet since it allowed more room to look at the monolith, it was such a dark space that I was happier people to have more room. Another job was finding any leaks of light into the room and trying my best to block them out. It wasn't a big issue for there to be imperfections in this installation as it was so dark, people will only see glimpses. I then finished off with completing the installaion of the elecronics into the monolith. Which had a few hiccups but where swiftly solves by having spare equitment to swap in for broken or damaged parts. I was then finished. The health and saftey challenges I faced during the degree show where quite minor. I bought a fire retardant spray for the material. I used a wide step instead of a ladder as it is much more stable for heights I will be needed to reach. I have had all the equitment past tested, which all went to plan apart from needed a different computer case due to it having large holes in the side. During the install the health and saftey team were worried about the fabric ceiling I had made and its permabibility to the sprinker system. This was quickly solved by me offering to cut a hole in the ceiling directly above the monolith so that the sprinklers could reach the heat source.

The carpet and material makes the room warm, soft and dampends the sound, making the room very muffeled and distant from the rest of the building. The material makes the room dark, placing the work inside of a void. The mirrors make it a place of pilgrimage; of great importance. Surrounding the monolith they reflect all around so you can see all sides of the monolith from one position, This allows you to understand the physicality of the video, it gives it a position in space. You also see yourself in the mirror, giving a meditative and reflective quality to the work. People are stood and not sat so they can explore the work, there should be an exiting and advertours nature to the work. The door is made of a thicker fabric, as it is the one people will definatly touch I wanted it to have that same warm and comforting feeling. The video was designed with a main direction, there is one monitor that is more directed than the others. This is intentional, it shows the different aspects of a journey. The drivers seat or the front of the train, the passangers veiw out the car window, or the veiw out the back, that you don't look at all the time, but its always there, you can always check to see where you have come from. It is important for people to know that there is a a veiw of everything. For me this piece is a monument of how far I have come, it depicts my journey, the title of ruin, is a two fold meaning. These are my degrading memories, ruined over time, but like any fallen down building, remains beautiful. And there is the ruin of the person that experienced these places, I no longer know him, that was a past version of myself, but they form the foundation of who I am now, my past self was ruined by these experiences to produce somthing different. There is always a rebuild ontop of a fallen building.

I made the audio mostly from field recordings I had gathered this year. There is one recording of new years, at 12, the fireworks represent the cell and the gravity simulation. There is also a elevator recording that I use a contact micophone attached to the elevator walls to capture the rumble and screeches of the elevator, I used this for the city section and the train station as it is close in feel to these places. The rest of the field recordings were on walks and in my garden, capturing the sounds of birds and the snapping of twigs and the rustling of leaves. I use field recordsings as they capture the expance of the enviroment rather than creating a inntamate recording, it should be wide and match the space you are looking at. I discovered this affect after listening to the album 'everything perfect is already here' by 'claire rousay' ontop of my video. It had a wonderfully dreamlike quaility but also reflective and allowed time for you to breathe. There is also a recording of the Bedroom Exhibition in this audio. While I was performing my friends were chatting in the background, the recording picked up a story my friend Freddie Bubble was telling about finding rubble in his garden. I felt like this was very fitting to the work and I really wanted to include vocals, both rousay and fred again.. use vocals in new ways that have inspired me. rousay muffles her recordings of conversations untill only certain parts are ledgible, but these are very intermate conversations, they create a sense of authenticity and reflection that I want to replicate. Fred again.. uses found recordings of social media and enhances what beauty they hold, by filtering and looping them. Again, this gives a very intermate and authentic feeling to the music that fits the vibe of what I want people to be feeling, this story is about me, its about finding rubble in your garden and having to face that fact, the destruction of something beutiful.

23 Keir Chaggar-Brown - Curriculum Vitae

56 Broadgate Lane, Horsforth, Leeds, LS18 4AG | Mobile: 07900852020 | Email: keircb@outlook.com

23.1 Profile

A self-taught digital artist specialising in Blender and photogrammetry focusing on mindfulness in immersive dreams scapes and showcasing work through YouTube and exhibitions.

23.2 Education & Qualifications

Glasgow School of Art | BSc (Hons) Sculpture and Environmental Art Ongoing | 2019 – 2023
Horsforth High School | A-Levels: Art (A*) | GCSE's: 10 A*- C | 2008 – 2015

23.3 Emplyment & Work Experience

Lead Creative Director and Lead VFX Artist | Luciid | 2021 - 2022

- Working to a brief. Video concept around a theme.
- Liaised with the CEO to determine desired output through an iterative process.
- Reworked a workflow over the employment to deliver a product as fast as possible. Managing expectations and quality due to this limitation.
- Produced 2 commercials, 1 short advertisement and 7 concept art videos.

Sound Director and Musician | Keir Chaggar-Brown Ltd | 2021 – 2022

- Produced various sound pieces often directed by the CEO of Luciid.
- Sourced and recruited voice actors and worked with them to write scripts and record their performances, mixing and producing them into the music.

Workflow Private Tutoring | Keir Chaggar-Brown Ltd | 2021 – 2022

- Point cloud workflows using blender for various uses.
- Walking through a complex software package and highlighting areas of artistic control.

Technical Consultant | Keir Chaggar-Brown Ltd | 2021 – 2022

- Explained the technical requirements for a photogrammetry shoot, outlining everything that could go wrong.

Photographer & Documentarian | Keir Chaggar-Brown Ltd | 2024

- I volunteered to documented a artists collectives football match.

DIWO Art Collective

- Collaborate on art installations and exhibitions. Technical, organisational and curtuorial skills.

23.4 Exhibitions

Shredded Wheat | House for an art lover, Glasgow | 2022

- This exhibition had many challenges which lead me to adapt and incorporate the site into the work.

Rooftop Exhibition | 101 Portman Street, Glasgow | 2022

- I was approached by a fellow student to join their exhibition where I displayed several works.

- Curation of this space involved DJs and screen placement.

Freddie's Exhibition | Pipe Factory, Glasgow | 2022

- I was approached by a fellow student to join their exhibition where I displaced works based on cell division.

McNeils Exhibition | McNeils | 2024

- I projected the inside of a closed pub on the outside while it was closed for regulars to reminiss.

Bedroom Exhibition | 100 Bowman Street | 2024

- I exhibited my work alongside 2 flatmates in a public exhibition of our flat and our artwork. I exhibited a 3 monitor 270 degree audio visual installation.

DIsWuptiOn | Old Toll Bar | 2024

- I VJ'd along side 5 other DJ's for a 5 hour set. I performed real time visuals.

23.5 Skills

- Blender - Motion tracking, lighting, animation, rendering, simulations, modelling and environmental design.
- Colmap - Point cloud generation for artistic use.
- Da Vinci Resolve - Video editing and colour grading.
- YouTube - Advertising my work and growing a community, using tutorials as the main way to increase the audience and viewership to the rest of the work.
- Linux - I have knowledge and experience using Linux systems and FOSS tools.

23.6 Portfolio

Follow this link to find my YouTube channel to see all of my video work @KeirChaggarBrown ↗ Please don't hesitate to contact for further information or details of any works.

SCHOOL OF FINE ART
THE GLASGOW SCHOOL OF ART

Degree show proposal form

YOUR FULL NAME: Keir Chaggar-Brown

PROGRAMME (Double click on the box to check it)

Fine Art Photo	☐	Sculpture & Env. Art	✓	Painting & Printmaking	☐

ACADEMIC TUTOR'S NAME:

What kind of space do you require? (Double click on the box to check it).

Wall space	☐	Floor Space	☐
Wall and Floor space	☐	Dark space	

Other (please describe) ✓
A Room. This must be a dark space with a ceiling.

PROPOSAL: Please insert a proposal for your work here (up to 150 words):

I am proposing a immersive screening of an audio-visual work.
This will take place in a dark and enclosed space, with 4 walls and a ceiling. There should be a space for a door which I will fill myself. or a door I can remove.
Rough dimentions of 3 x 3 meters. With an additional alcove on the door as a light trap. Around 1.5 x 1 meters.
Walls to be painted (Black & Gray)

a "monolith" containting 2 videos on its front and back, via monitors and accompanying audio from a video I will make. Played on speakers mounded in the ceiling. There will be a carpeted floor.

DIMENSIONS/SPACE: Indicate the approximate dimensions of the work that you plan to install (or dimensions of required installation space / or specific identity of space if this applies):

So the room needs to be around 3x3 meters, with a low ceiling, around 2m.

The “monolith” will be in the center of the room, from floor to ceiling and has 2x43” monitors wall mounted. The 3x3 room allows people to walk all around the work.

AUDIO-VISUAL: Indicate what - if any - AV equipment you anticipate using and how this will be used. Please include whether any sound will transmit in the space or via headphones:

2 monitors, placed vertically back to back on a “monolith”

2 speakers and 1 subwoofer. Sound will be played outloud and sometimes may be loud.

SPECIFICS: Please give an indication as to whether you will be working at height (and thereby require the use of ladders or platform), require the services of an electrician, need to be close to a power supply etc. Indicate any particular requirements including (but not exclusive to): black-out; sound proofing; brick/load bearing wall; height of wall required, number of plug sockets, alterations at floor-level, notable risk etc:

If you have specific space or resource requirements - i.e. proximity to water, electricity, proximity to a lift for movement of heavy work, etc. please give a detailed description of your reasons and requirements. Drawings or diagrams can be included at the end of this form, as appropriate.

I will need access to power for the monitors and speakers (around 6 socket or extension leads due to low amperage.

The room will need to be enclosed with a door, for complete darkness.

There will be a ceiling around 2 meters high.

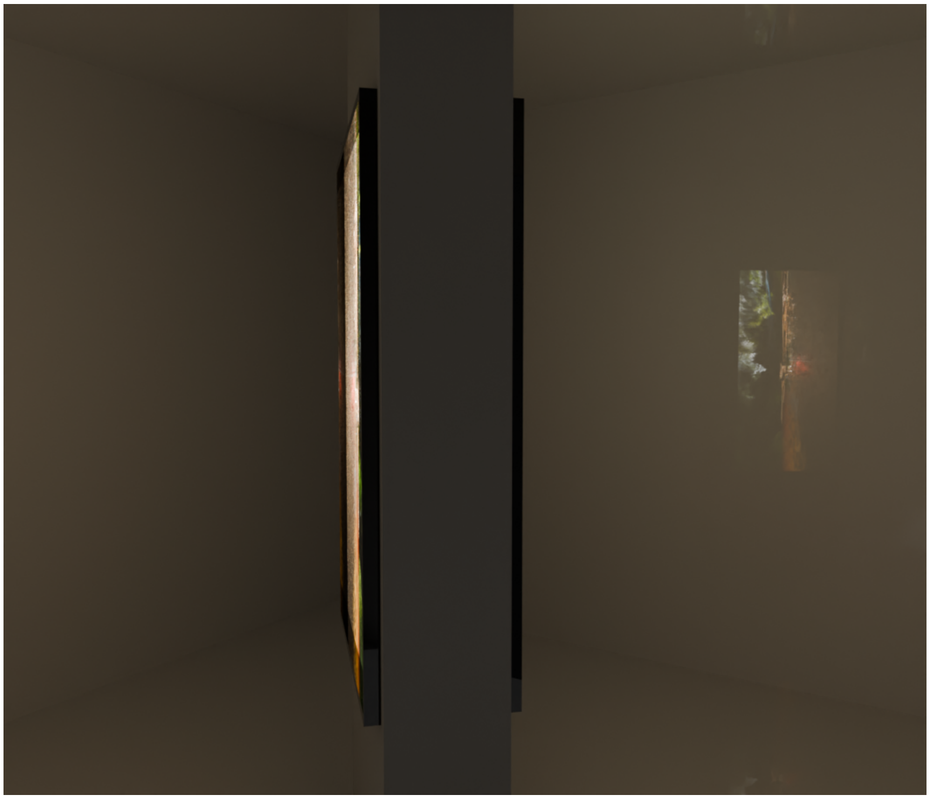
The floor will be carpeted.

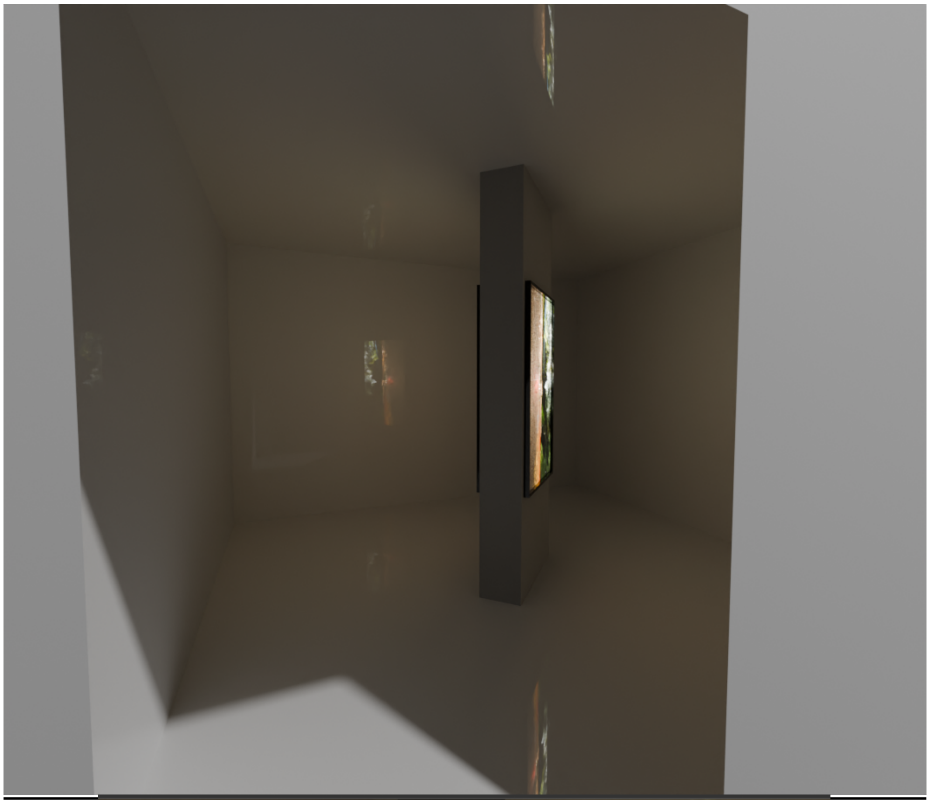
NOTE: All students will be required to complete a Risk Assessment form, which follows this section.

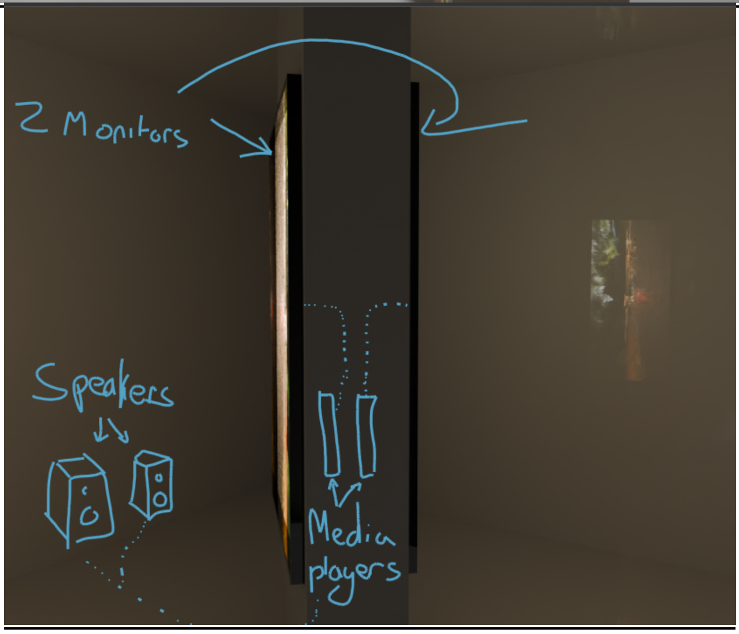
SIGNED BY STUDENT: Keir Chaggar-Brown

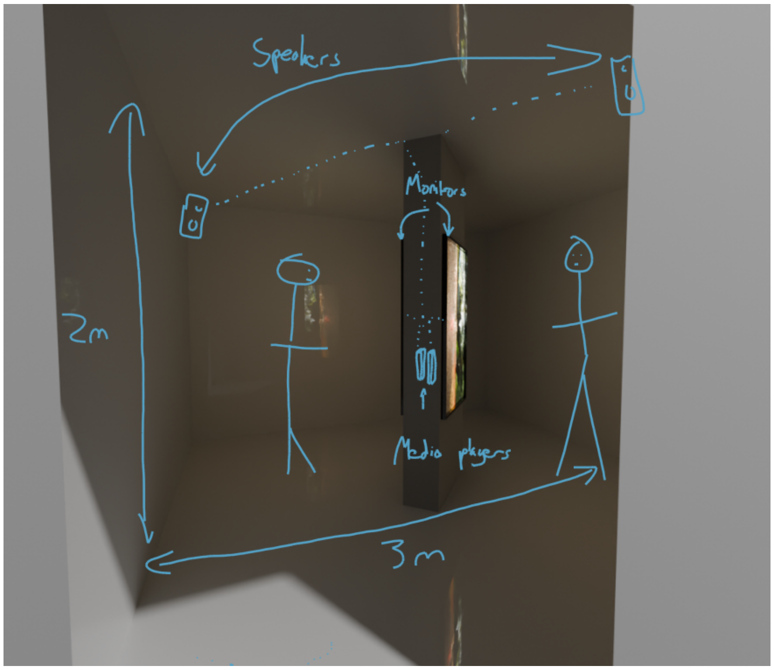
DATE: 28/02/24

Please include any backup visuals on this page – left blank for this purpose






2 Monitors
Speakers
Media players



Degree SHOW *Risk Assessment*

This should be submitted **along with** the proposal and uploaded to Canvas.

SCHOOL OF FINE ART
THE GLASGOW SCHOOL OF ART

Name Keir Chaggar-Brown		Date 28/02
Mobile Number 07900852020	Email K.cbrown1@	Dept. SEA

Section 1

What are the health and safety risks you have identified in your proposed work/degree show submission - This should include risks that may be encountered **during install, while the show is open to the public *and* during de-install**. (See over for guidance notes, and Continue on a separate sheet if necessary).

Dark Room,				
What measures will you take to minimise these risks to an acceptable level: (Continue on a separate sheet if necessary) There is nothing to trip over.				
Are there any additional control measures required? (Please double click on the box to check it) e.g. addition of COSHH data sheets (if yes, please attach to this form), manual handling etc. **YES** ☐ **NO** ☐ If yes, please state what the additional control measure(s) is/are.				
Overall category of Risk (please double click to check) (see over for guidance notes)	**EXTREME** ☐ **(Unacceptable)**	**HIGH** ☐ **(Unacceptable)**	**MEDIUM** ☐ **(Tolerable)**	**LOW** ☐ **(Acceptable)** ✓
Student's Signature:	**Keir Chaggar-Brown**			
4th year tutor's *OR* Head of Department	Signature:			Date:

Commented [C11]: ???

Section 2 (to be completed **immediately prior** to install *and* **whenever changes to the proposal are made**).

Have there been any changes to your proposal that would require you to expand upon, amend or complete a new risk assessment? (Please double click the box to check it)

YES ☐ **NO** ☐

****If you have answered YES to this section, you must attach change control form and submit it to your year tutor, HoD, and dept. admin.**

*****If you make additional changes DURING install, again, it is your responsibility to attach a final change control form and resubmit as above.**

Guidance note on aspects to consider for risk assessment:

- **Is the work heavy?** If yes, how will you move it, might it affect the structure of the space it is in?
- **Will the work be in an elevated position?** If so, how will you get it into that position, how stable is it, how is it fixed, how will you remove it? (by elevated, we *don't* mean images hung on walls by conventional means).
- **Could the work fall over**? If yes, how will you stabilise it and/or prevent it from damaging the viewer or it's surroundings?
- **Does the work require electrical power**? If yes, has the electrical equipment been PAT tested, how will you get power safely to the work, if outside how are you going to ensure safety? How will you deal with the wires leading to the electrical device?
- **Will you need to use power tools on site?** If yes, what are the tools, and are they safe to operate outside, could they provide a danger to you or the public?
- **Will you be doing a performance on site?** If yes, how are you ensuring both your safety and that of the public? Have you discussed this with your tutor?
- **Do any of the materials used in the work fall into any of the following categories: sharp, flammable, toxic, corrosive, airborne?** If yes, how are you ensuring that you and the public are safe, have you researched the potential hazards and have you taken appropriate action, breathing, eyes, skin etc?
- **Is access to the work difficult or dangerous for you or members of the public?**

RISK ASSESSMENT MATRIX

LIKELIHOOD DESCRIPTION	RATING	SEVERITY DESCRIPTION
Highly Probable	**5**	Death (R*)
Probable	**4**	Specified Injury (R*)
Possible	**3**	Unfit for Normal Duties for More Than 7 Days (R*)
Unlikely	**2**	Unfit for Normal Duties for Less Than 7 but More Than 3 Days
Highly Unlikely	**1**	Minor Injury

(R*) = RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013

OVERALL RISK *(Based on Likelihood x Severity)*

		SEVERITY INDEX				
		1	**2**	**3**	**4**	**5**
LIKELIHOOD INDEX	**5**	**5-MED**	**10-MED**	**15-HIGH**	**20-HIGH**	**25-EXTREME**
	4	**4-LOW**	**8-MED**	**12-HIGH**	**16-HIGH**	**20-HIGH**
	3	**3-LOW**	**6-MED**	**9-MED**	**12-HIGH**	**15-HIGH**
	2	**2-LOW**	**4-LOW**	**6-MED**	**8-MED**	**10-MED**
	1	**1-LOW**	**2-LOW**	**3-LOW**	**4-LOW**	**5-MED**

OVERALL RISK	DESCRIPTION
1-4 LOW	Low risks are largely acceptable, monitor periodically to determine situation changes which may affect the risk, or after significant changes
5-10 MEDIUM	Medium risks should only be tolerated for the short-term and then only whilst further control measures to mitigate the risk are being planned and introduced, within a defined time period.
12-20 HIGH	High risks activities should cease immediately until further control measures to mitigate the risk are introduced. The continued effectiveness of control measures must be monitored periodically.
25 EXTREME	Work should not be started or continued until the risk has been mitigated. Immediate action is required to reduce exposure. A detailed mitigation plan must be developed, implemented and monitored by senior management to reduce the risk before work is allowed to commence.

GLASGOW SCHOOL OF ART
Undergraduate Ethical Checklist for creative research (non-participant research)

ETHICS CHECKLIST FOR UNDERGRADUATE STUDENTS (NON-PARTICIPANT RESEARCH)

Who needs to complete this? This UG ethical checklist may be completed for all projects where any form of creative research is being undertaken without directly working with human participants. If you plan to gather data from human participants then please consult your tutor first. You may then be required to also complete the *'Undergraduate Ethical Assessment for work with human participants – Student From'*

What happens to this form? To complete the checklist please tick either 'YES' or 'NO' in each of the sections below. *If you think there may be any ethical issues, then seek advice from your Tutor.*

	Ethical Consideration	YES	NO
1	**Does your work involve working with human participants and the collection of their data? (participant research?)** [If YES, then speak to your tutor and complete Ethics Self-Assessment Form. Consult the UG Guidance Document, UG Ethics Policy]		✓
2	**Will you use live animals or other organisms in your study?** [If YES, then consult GSA's policy 'Use of live animals in study, installations and exhibitions', then seek advice from your tutor before proceeding]		✓
3	**Does the work have potential to impact negatively on the environment? (or third parties?)** [If YES, then seek advice from your tutor before proceeding]		✓
4	**Does the work introduce any potential threats to you or your audience's psychological wellbeing?** [If YES, then seek advice from your tutor before proceeding, consult the UG Ethics Guidance Document.]		✓
5	**Are visual representations of individuals or groups likely to be an issue?** [If YES, then seek advice from your tutor before proceeding, consult the UG Ethics Guidance Document.]		✓
6	**Could the work result in distress or safety issues for yourself beyond that which could be reasonably expected and easily managed?** [If YES, then seek advice from your tutor before proceeding]		✓
7	**Will the work take place outside of the UK? If YES, state the location:** [If YES, then seek advice from your tutor before proceeding]		✓
8	**Are there any potential issues in acknowledging sources or source material?** [If YES, then seek advice from your tutor before proceeding]		✓

I certify that the information contained in this checklist is accurate.

Project Title: Degree Show Proposal

Signed: Keir Chaggar-Brown Date:28/02/24

GLASGOW SCHOOL OF ART
Undergraduate Ethical Checklist for creative research (non-participant research)

ETHICS CHECKLIST FOR UNDERGRADUATE STUDENTS (NON-PARTICIPANT RESEARCH)

Who needs to complete this? This UG ethical checklist may be completed for all projects where any form of creative research is being undertaken without directly working with human participants. If you plan to gather data from human participants then please consult your tutor first. You may then be required to also complete the *'Undergraduate Ethical Assessment for work with human participants – Student From'*

What happens to this form? To complete the checklist please tick either 'YES' or 'NO' in each of the sections below. *If you think there may be any ethical issues, then seek advice from your Tutor.*

	Ethical Consideration	YES	NO
1	**Does your work involve working with human participants and the collection of their data? (participant research?)** [If YES, then speak to your tutor and complete Ethics Self-Assessment Form. Consult the UG Guidance Document, UG Ethics Policy]		✓
2	**Will you use live animals or other organisms in your study?** [If YES, then consult GSA's policy 'Use of live animals in study, installations and exhibitions', then seek advice from your tutor before proceeding]		✓
3	**Does the work have potential to impact negatively on the environment? (or third parties?)** [If YES, then seek advice from your tutor before proceeding]		✓
4	**Does the work introduce any potential threats to you or your audience's psychological wellbeing?** [If YES, then seek advice from your tutor before proceeding, consult the UG Ethics Guidance Document.]		✓
5	**Are visual representations of individuals or groups likely to be an issue?** [If YES, then seek advice from your tutor before proceeding, consult the UG Ethics Guidance Document.]		✓
6	**Could the work result in distress or safety issues for yourself beyond that which could be reasonably expected and easily managed?** [If YES, then seek advice from your tutor before proceeding]		✓
7	**Will the work take place outside of the UK? If YES, state the location:** [If YES, then seek advice from your tutor before proceeding]		✓
8	**Are there any potential issues in acknowledging sources or source material?** [If YES, then seek advice from your tutor before proceeding]		✓

I certify that the information contained in this checklist is accurate.

Project Title: ruin

Signed: Keir Chaggar-Brown Date: 10.05.24

SCHOOL
OF FINE ART
THE GLASGOW
SCHOOL OF ART

Student Self Evaluation Guidance Course Fine Art Studio

Name	Keir Chaggar-Brown	**Department and Year**	SEA4	**Date**	10.05.24

Please evaluate your own achievements in regards to the three assessment categories **Research, Studio Practice and Professional Practice** and in relation to the Intended Learning Outcomes assigned to the stage of your studies.

Research

This year I had to preplanning everything due to the size of project I wanted to make. I implemented actual plans and deadlines for my work that had to be met. Also researching methods of planning to know I am making the right decisions. I also had to deal with deadlines over runnig and finding the quickest solution.

I have really delved into the art world and improved my understanding of the artists relevant to my practice. I studied others work throughout this year from a wide range of mediums.

By finding more Art I like I have been able to learn about my own practice and realise assumptions I had previously made were incorrect.

I had to do lot more technical research this year than I have ever done. This was due to how multifaceted the project was. I had digital research about cell simulations and rendering performance. Different projectors and projection methods for a 360-degree installation. But also, practical research like the quickest and cheapest way to make a room dark and how I could cheaply make very large mirrors.

Overall, I feel like the research I did this year really helped me progress my practice in a meaningful manner, by refining my knowledge with more diverse sources.

Studio Practice

Making such a long video was very challenging in ways I didn't expect. However, I was able to make tools to assist me as I learnt. Tool making is something I have never had to do before. I also was able define what I was trying to make which allowed me to perfect what I have and cutting out extraneous elements. It also allowed me to make more meaningful decisions, like choosing the cell simulation point cloud, it suddenly gave the work more purpose and direction. I feel like I was more effetely telling the story that I have been trying to tell. Lots of technical and planning challenges faced me with the simulations and trying to make a 10 minute long video. It was also very good to refine the environment that I situate the work in. I spent a large part of this year planning and thinking about the environment rather than making the video. With the environment more decisions came down to compromises with the real world which is a change for me as most limitation doesn't exist in the digital, so I really had to prove myself in fabricating the environment. This was also my first time working with multiple screens and projectors which was the greatest hurdle this year. Due to limitations that cannot be seen until they are tested, I couldn't rely on my intuition as much as I usually do as the building blocks were so complex. Also, In the studio I found myself in my work this year. This was a personal moment of growth but also an artistic one. Since I knew what I was already making and what I wanted to make now I could channel the work more in the direction I wanted.

Professional Practice

I have expanded most in my outreach this year; it has always been a weakness and working and collaborating with so many people this year has really opened me up to art which I wouldn't usually consider adjacent to my practice. I have finished a multiple year project this year, which took a lot of work to bring everything together. I also expanded into areas of Proposals and Sponsorships which worked out very well for me and I wouldn't have been able to render this project without the equipment I received. Being part of DIWO also has lots of potential for me in the future as the collective grows and our bonds strengthen.